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Psychological Bulletin

THE PROBLEM OF GENERAL QUANTITATIVE LAWS IN PSYCHOLOGY¹

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The problem of general quantitative laws in psychology is a very broad, complex, and technical one. You should be relieved to know that I shall not attempt to analyze it in any systematic and exhaustive fashion. Instead, I shall endeavor to make a constructive contribution to the problem by consideration of but two matters: first, a viewpoint regarded as the one most apt to be productive of general quantitative laws; and second, by way of illustration of that viewpoint, one newly derived law which applies to a vastly greater variety of situations than do any of our present laws.

The viewpoint believed to be the most serviceable in the formulation of quantitative laws rests largely upon the nature of the primary, quantitative data of psychology. If one examines any large number of psychological investigations, he will find that the actual observations deal with the activities of organisms or the more or less immediate results of these activities. These activities are usually described in connection with the environmental circumstances under which they occur. In instances so rare today as to be almost exceptional, the activities studied are alleged internal events occurring within the experimenter and observable only by him. As a rule, however, the activities studied are those of other organisms than the experimenter and are of the sort which, presumably, anyone present could also observe. It is only in the case of this latter sort of behavior—behavior which lies, so to speak, on the surface and which might be termed surface behavior—that direct measurements, or at least moderately direct ones, are feasible. One after another, psychological systems come to the fore and

¹ Presidential address delivered at the Forty-ninth Annual Meeting of the American Psychological Association, Northwestern University, Evanston, Illinois, September 5, 1941.

then subside; but the measurements of psychology continue to be, as they have always been, measurements of attributes of behavioral responses or their products and of the environmental conditions under which these responses occur. From the fact that the primary observations of psychology are in the first instance almost entirely observations of surface behavior and its products, and from the further fact that the attributes of such behavior are measurable, it follows naturally that psychology is very largely a quantitative science.

When, from measurements of behavior or its immediate results, one argues that he has measured some unobservable conceived to exist within the individual, he is always on very unsafe ground. It is probably true that theoretically all measurements are to a degree indirect and involve some assumptions. But the indirectness of measurement does not mean that one can use his imagination freely in postulating the nature of the thing measured. The thing measured must be definable in terms of the obtained measurements; it must, in fact, be definable as a known mathematical function of the actually measured attribute. For example, it is possible to measure the time elapsing between the occurrence of a stimulus and the pressing of a key—what is known as reaction time. Now one could construct a theory postulating such a thing as will; one could then assume further that will varied as regards the quickness with which it could be mobilized for use; and one could then argue that reaction time measured the quickness with which the will got into action. But, to be sure that he had measured this agility of will, one would first have to establish the mathematical equation between that hypothetical concept and the times actually measured. Obviously, to do this would be impossible; and to attempt it could only result in inconclusive argumentation. It is by no means my intention to deny the importance of what goes on within the individual, whether these goings-on be described in physiological, conscious, or more mysterious psychic terms; nor is there any inclination to minimize the importance of knowing all that can possibly be ascertained about these internal events. It is desired simply to point out that the making of psychological measurements does not entail a penetration within the skins of our subjects, whether these be human beings or white rats; and that it should be possible, consequently, to formulate the relations existing between our measurements without making elaborate assumptions concerning the nature of

internal processes and their relations to our measured magnitudes.

Is it possible to construct a science of psychology from such measurements? Apparently a very large proportion of psychologists do not think so. Many appear to take the view that while all our measurements deal with environment and behavior, what psychologists should be most interested in is neither, but intermediate events occurring within the organism. Assumptions concerning these events seem often to be regarded as necessary for the explanation of the obtained measurements. Since it is difficult for the psychologist to observe the interior of his subjects, the sort of events which occur in the region between stimulus and response must be left largely to the imagination. And our imaginations have not failed us. The things we have stuck within the organism in the hope thereby of explaining behavior are almost without limit in number and variety. They include mental sets and cortical sets, traces, residues, synaptic resistances, inhibitory and excitatory substances, inhibitory and excitatory tendencies, determining tendencies, mental attitudes, sentiments, wishes, tensions, field forces, valences, urges, abilities, instincts, and so on and on. Very popular indeed is the animistic type of explanation. Freudian concepts, in spite of severe condemnation, are still widely used, whether in their original, crude form or disguised by a clothing of scientific and mathematical verbiage.

We tend to forget that all explanation in science must be in terms of established relationships of dependency—that is, in terms of laws; and laws, if quantitative, require measurements. Now the things referred to by the speculative constructs just mentioned obviously cannot be directly measured. In many cases, their very existence is open to question. However, it is always possible, after imagining an internal scheme of events, to postulate certain relations between these events and behavior. One may then measure the pertinent attributes of behavior and argue that he has measured some feature of the internal happening alleged to be the cause of the measured behavior. For example, we might measure an attribute termed strength, postulated to be a property of an internal entity called a food-getting drive, by measuring the frequency with which an animal crosses a grill to arrive at food which he is allowed to reach but not allowed to eat. If this were done on a number of occasions, we would obtain a number of measurements, and these might be termed indifferently measurements of the frequency of grill crossing or measurements of strength of

drive. But note that only one set of measurements would be secured. Certainly no one would, on the basis of such measurements, set up as a quantitative law the statement that the number of crossings varies in direct proportion to the strength of the drive. Such a statement would be a pure tautology, for we have used measurements of crossing frequency as though they were the same thing as measurements of strength of drive.

Even if we assumed that we had measured the strength of some motive, or other hypothetical internal event, we would still have no law, for a law takes the form $y=f(x)$ and therefore requires two sets of measurements, one pertaining to the y variable and one to the x variable. Possessing only measurements of the y variable, we would still have to inquire where are the measurements of the x variable. The x variable is that which would account for the properties of the event placed inside the subject in order to explain his behavior. Concerning the nature of the x variable we frequently encounter a profound silence. Motives or wishes are posited as primary explanatory factors, as the springs to action; but we are often left in the dark as to the causes of the springs. Before we can have a truly quantitative law, we must know and be able to measure the determining conditions of the properties of these springs. But if these determining conditions, the x variables, are measurable, they will be either environmental variables or attributes of behavior. Consequently, after all our theorizing, we shall end up with a law which merely relates behavior to environment or else relates behavior of one sort to behavior of another sort. In view of these considerations it is easy to understand why, as a matter of fact, most of the quantitative laws of psychology, derived throughout a period of over a century, refer to relations between environment and response.

The quantitative laws of psychology, then, for many years to come, may be expected to be laws relating aspects of behavior either to environmental characteristics or to other aspects of behavior. A law, however, includes a great deal more than y and x , inasmuch as it states a function in terms of certain constants or unknowns, termed parameters. Even the equation of a straight line, $y=a+bx$, contains the two parameters, a and b . Now these parameters may refer to anything whatsoever, conscious, physiological, environmental, psychic, or purely imaginary. Here one is free to follow his predilections, whether for motives, excitatory and inhibiting substances, field forces, states of disequilibrium,

inertia of the nervous system, abilities, or what not. It does not much matter, so far as quantitative laws are concerned, to what the parameters refer, since in the present state of knowledge they are seldom independently measurable. The important thing is to determine how many parameters are needed and the function of each of them. This can be done simply by mathematical analysis of the observed relations between environment and behavior. It is possible, therefore, to write the correct equations without knowing precisely what the parameters represent as regards the situation inside the subject. Even did we know with certainty precisely what they stood for, the predictive value of our equations would not be enhanced one iota unless it were possible directly, and independently of our measures of the y and x variables, to measure those parameters.

It seems, therefore, to be an entirely rational procedure to formulate the observed relations directly, on the basis of mathematical analysis. Psychological laws will, of course, always have reference to a physiological organism; but it is unnecessary for us as psychologists to specify the precise nature of the physiological functions referred to by the needed parameters. However desirable it may be, it is unnecessary to know the physiology of intelligence in order to measure it and to formulate laws concerning it, to know the physiology of memory in order to express the probability of correct recall as a function of the number of repetitions; and we need not first construct a theory of the physiological mechanism of successive comparison either to discover the falsity of Weber's law or to supply a correct formulation. There is no need first to invent weird or original things to stick inside the organism, then to make hypotheses about the properties of these imagined things, and finally to manage to interpret observational data in terms of the imagined consequences of these imagined internal entities. On the contrary, it is far safer and sounder to carry out investigations, exhaustively to analyze and summarize the data, and then to determine the extent to which the conclusions reached in a particular instance may be generalized. This procedure seems the one most likely to lead to broad generalizations because it releases us from preoccupation with the details of internal mechanisms—mechanisms which may vary enormously when considered in their totality, but which may exert identical quantitative effects upon behavior. Quantitative psychological laws so derived are, if you will, superficial laws—superficial in the sense that they state the

relationship between events observable from a position outside the behaving organisms. They are, nevertheless, as explanatory and as truly psychological as any laws which psychologists may hope to formulate.

The preceding discussion constitutes an outline of a viewpoint from which one may construct general psychological laws. Obviously, the value of the viewpoint can be established only by pointing to laws constructed in accordance with it. Unfortunately for the purpose of the present paper, no very broad quantitative laws have yet been established. Investigators of different situations, such as those prevailing in experiments dealing with rote memory, reaction time, discrimination, learning, and practice, have each proposed formulae that are specific for that situation. In fact, for some of these situations, notably that of learning, several different laws have been proposed. It is true that some of these laws are by no means entirely specific. For example, Courtis has succeeded in applying a law proposed by Gompertz to a wide range of cases of learning, practice, and growth. Some of Hull's laws, which are stated as laws of rote memory, could possibly be generalized so as to apply to other learning situations and perhaps to some quite different situations. Again, Weber's law has been supposed to hold over the middle range of stimulus intensities for all varieties of intensive stimuli. On the whole, however, it remains substantially true that psychology possesses no very general quantitative laws.

In view of this situation it seemed necessary, in order to demonstrate the fruitfulness of the viewpoint which has been described, to attempt to apply it in the derivation of a truly general law. Accordingly, about 20 sets of quantitative observations made by various investigators were assembled and—it must be confessed, with a good deal of doubt concerning the outcome—were subjected to various types of mathematical analysis. The study indicated at least one generalization that would hold for all of the data examined, a law conceived as expressing the relationship between attributes of performance and the environmental variables on which they depend.

The formula for this law is based on the shapes of these plotted relationships experimentally observed by numerous investigators. The study of these relationships revealed a very impressive fact, namely: no matter how favorable the status given the environmental variable, goodness of performance was limited. Man

is clearly a finite organism and never does anything infinitely well. As the environment is made more favorable he improves, yes, but the more he improves the more obvious it becomes that, no matter what degree of favorableness be imposed upon the environmental conditions, there is a limit in goodness of performance that can never be exceeded. Now there are various ways of stating this truth in mathematical language. The expression chosen is that which, of all simple ones, seems to agree best with the existing data. It consists of the product of what may be conceived to be an upper limit, termed k , and a function which increases with increase in the environmental variable, namely: $1-f^z$, in which f is a positive fraction less than unity. If this were the whole story, we could write an equation stating that y , the measured attribute of performance, equals $k(1-f^z)$. This law, expressed graphically, would take the form of a curve which is negatively accelerated throughout and approaches an upper limit asymptotically—that is, a form roughly resembling the upper part of the letter S.

It is obvious, however, that a second factor must be taken into account, one whose influence is greatest when the magnitude of the environmental variable is very small. In numerous cases the lower part of the curve relating goodness of performance to the environmental variable resembles the lower part of the letter S. To account for the shape of the lower part of the curve, a factor designated by the letter p was assumed, and the magnitude of response considered to be the square root of the sum of the square of this factor and the square of the factor already mentioned. The parameter p is considered to represent merely a potentiality for response, since, in the complete absence of the environmental variable, the equation would become $y = p$, but there would be no actual performance.

Nothing is known or assumed concerning the physiological factors or complex of factors which determine the values of the parameters: p , the potentiality for response; k , the upper limit; and f , the fraction which determines how rapidly the limit is approached with increase in the environmental variable. In all probability the physiological factors determining the values of these parameters are not only complex but vary greatly with the type of behavior and the environmental variable.

Lastly, allowance must be made for the fact that either behavior or environment, or both, may be measured by scales with an arbitrary zero. To allow for this arbitrariness of zero points, it

is necessary to introduce two additional parameters, one represented by the letter a , to control the origin of the y scale, and another designated d , to correct the zero point of the x scale. The way in which all these parameters were combined is indicated by the equation which appears in Figure 1.

The law thus arrived at appears to have a truly amazing degree of generality. Apparently it holds in the case of all learning and practice curves, either with human beings or with white rats, provided the curves adequately show the increase in accomplishment with increase in number of trials or amount of time. It agrees with data from experiments on memory—for example, those showing the increase in number of nonsense syllables correctly anticipated with increase in number of trials, and also those bearing on the course of forgetting. It fits various sets of data dealing with reaction time. It gives correctly the relations which Weber's law describes incorrectly. It applies to pitch discrimination as well as to intensity discrimination. It agrees with certain formulations of the increase in intelligence with increase in age. How well it does all this, you will be able to judge from the graphs which follow.

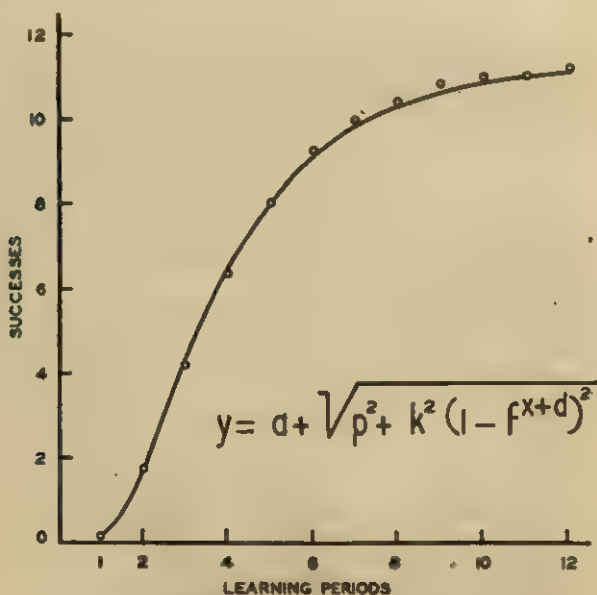


Fig. 1. Learning in Generalized Abstraction
(Data from Hull (2). $p = 15.236$; $k = 21.548$; $f = .6635$; $a = -15.07$; $d = -1$.)

The formula, as indicated in Figure 1, is y equals a plus the square root of the sum of two squared magnitudes. The first of these squared magnitudes is p , and the second is the product of k into $1-f$, with f raised to the power $x+d$. It could be written in several slightly different mathematical notations,² and in certain conceivable cases it might be simplified, particularly if an approximation formula would suffice. In all of the figures the continuous curve represents the theoretical values calculated from the formula (by methods of successive approximations), and the small circles represent the original unsmoothed values reported by the investigator. The observed (y) and calculated (\hat{y}) values for each curve are listed in Appendix I.

Figure 1 shows data obtained by Hull (2) in a learning experiment. The learning involved abstraction and generalization, in that the subjects were required to identify and name the characteristic common to groups of Chinese characters. The scores, or y values, indicate correctness of response for successive 12-minute learning periods.³ As may readily be seen, the agreement between the two sets of values, the calculated and the observed, is an excellent one.

The next two curves, those in Figures 2 and 3, are maze learn-

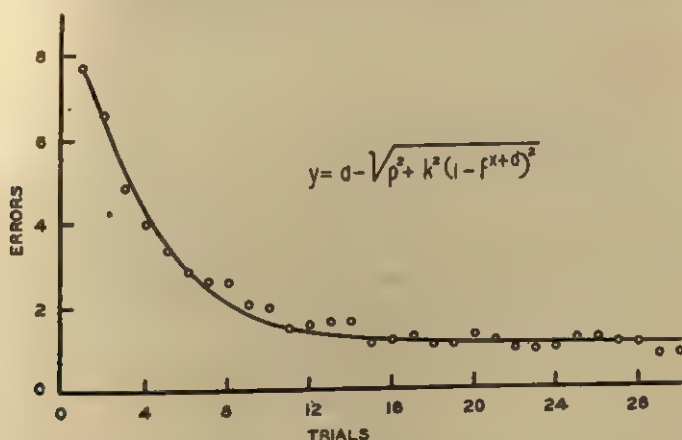


Fig. 2. Maze Learning Error Curve (Means From 47 Rats)
(Data from Stone (10). $p=10.3063$; $k=14.5753$; $f=.7418$; $a=18.90$; $d=.2$.)

² For example, in place of $k^2(1-f^{x+d})^2$, one could write $k^2(1-e^{-c(x+d)})^2$, in which e stands for the natural logarithmic base.

³ In the case of one representative subject, Cha.

ing curves based on data obtained by Stone (10). The first of these is an error curve, and the second a time curve. They represent the mean scores made on a multiple-T maze by a group of 47 rats.⁴ Like most time and error curves they are conventionally plotted so that the score *decreases* with increase in the environmental variable, number of trials. Since the law here under consideration implies that the measured attribute of performance *increases* with increase in the favorableness of the environment, these curves are inverted before they are fitted—that is, they are rotated 180° on

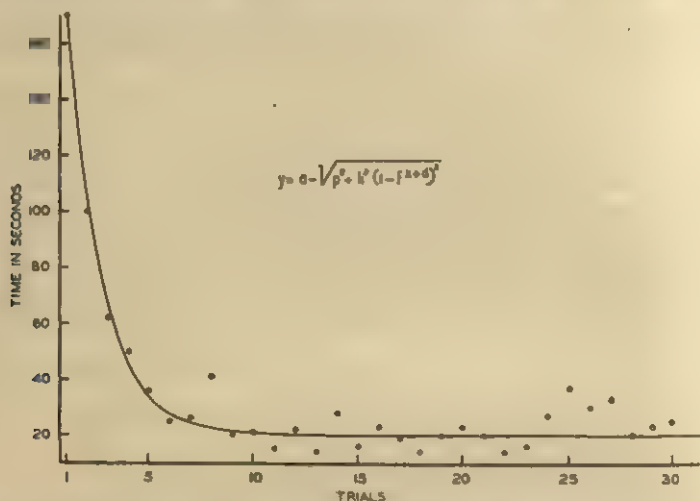


Fig. 3. Maze Learning Time Curve (Means From 47 Rats)
(Data from Stone (10). $p=3.1623$; $k=289.7$; $f=.5497$; $a=309.7$; $d=.1$.)

their horizontal axes.⁵ After being thus rotated,⁶ their height at any point indicates goodness of performance, and they show an increase in this goodness with increase in the number of trials. No change, however, in the general form of the equation is required in order to write it so that it fits the data as usually plotted and as here displayed—that is, from the present viewpoint, upside down. This inversion of the curve changes the required value of one of the parameters, a , and requires the use of the negative root of the expression under the square root sign.

⁴ The group varying in age from 31 to 60 days.

⁵ By subtracting each y value from the value for the first trial.

⁶ The curves should be considered in this rotated position in estimating the plausibility of the calculated values of the parameters, particularly the parameter p .

Figure 3 shows time measurements made on exactly the same performances as those represented by the error measurements shown in Figure 2. The performances are the same, but the measured attribute has changed from correctness to time. Likewise, the shape of the curve and the values of the parameters have changed. It may be mentioned that the formula here used has also been fitted to several other maze learning curves, including a well-

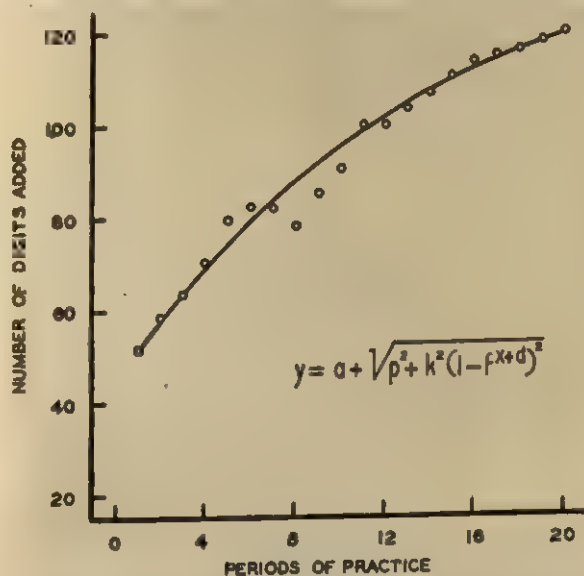


Fig. 4. Practice in Horizontal Addition

(Data from Woodrow (12). $p=100.025$; $k=244.102$; $f=.9235$; $a=-123$; $d=10$.)

known time curve by Watson based on the mean time scores of 19 rats.

Figure 4 represents an entirely different matter, improvement with uncorrected practice in horizontal adding on the part of one college sophomore. The number of practice periods indicated along the x axis is 20, but was really 60, since each plotted score is the mean of three periods of practice of 10 minutes each given on three consecutive days. The curve is a rather typical practice curve, and any one of literally hundreds of such curves which are available could equally well have been used. It should be pointed out, however, that a curve such as this, considered alone, does not afford a very satisfactory test of the formula, for the reason that it represents only the latter portion of the subject's total learning. Ac-

cording to the curve here fitted to the data, pre-experimental practice or its equivalent was equal to 10 units on the base line—that is, to 30 ten-minute periods of practice.

Any general law relating performance to environment should certainly have application in the field of reaction time. There are at least two environmental variables which have been established as causative factors of reaction time: the intensity of the stimulus and the duration of the preparatory interval—that is, the interval between a warning signal and the stimulus. Both of these factors

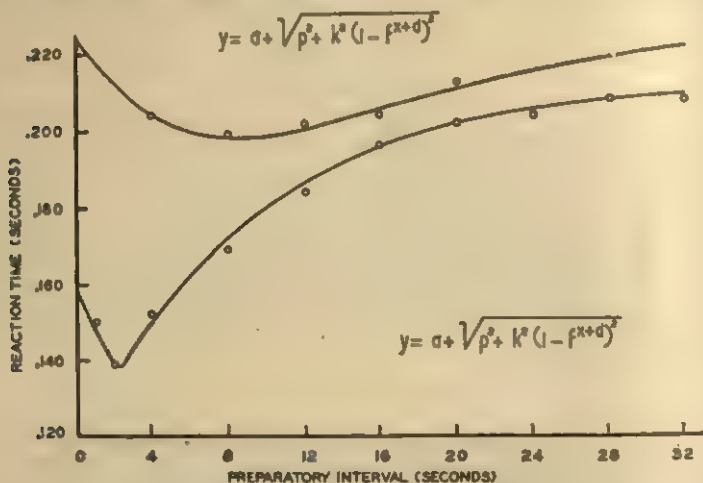


Fig. 5. The Relation Between Reaction Time and Preparatory Interval (Data from Woodrow (11)). Values of parameters of upper curve: $p=44.721$; $k=63.246$; $f=.9283$; $a=153.3$; $d=-8.3$. Values of parameters for lower curve: $p=2.4207$; $k=76.519$; $f=.8944$; $a=136$; $d=-2.2$.)

appear to exert their effect in accordance with the proposed law. Figure 5 shows the relation between reaction time and preparatory interval. The lower curve in the figure shows the effect of variation in the length of the preparatory interval when only one length was used at a sitting, with the subject aware that the interval would remain the same. The curve indicates that for this subject, under the prevailing conditions, the most favorable preparatory interval was 2.2 seconds. The upper curve shows the results when different preparatory intervals, varying in length from 4 to 24 seconds, were mixed irregularly so that the subject never knew what length of interval to expect. Under these conditions, the most favorable duration of the preparatory interval was about 8.3 seconds. In

- both cases the fit of the theoretical curve to the observed times is excellent.

It is an interesting fact that these same data, as well as those shown in Figure 6, have been fitted by Landahl (4) by means of curves derived from certain biophysical hypotheses concerning an assumed physiological mechanism leading to the overt response. There can be little doubt that it is theoretically possible to derive a curve similar to any of those here shown by imagining in sufficient detail the nature of an internal set of happenings which

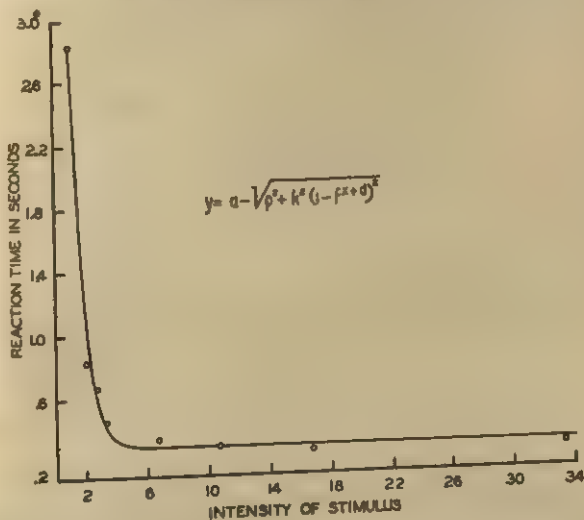


Fig. 6. Effect of Intensity of Stimulus (Gustatory) Upon Reaction Time (Data from Piéron (7). $p=.01$; $k=12.450$; $f=.2621$; $a=12.731$; $d=.167$.)

would account for the observed results. There is thus no reason why any psychoenvironmental law should not be supplemented by a psychophysiological law. While it is true that Landahl's curves and those here shown are not identical, they closely resemble each other in shape and in the number of parameters employed, so that the two sets of curves taken together may be regarded as representing an approach, at least, to the supplementation of the laws of what I have termed surface psychology by laws referring primarily to physiological events.

Several sets of data concerning the relation between reaction time and intensity of stimulus have been fitted. The curve here shown pictures the relation between reaction time and the concen-

tration of a sugar solution, as determined by Piéron (7), in the case of a single subject. As in most of this investigator's extensive work on reaction time, the number of reactions obtained with any one intensity of stimulus was quite small. It is perhaps for this reason that he largely ignored both the effect of practice and the variation in reaction time from sitting to sitting, both of which have by other investigators been found to be rather pronounced. It is a tribute to his carefulness in controlling conditions that, with such a small number of reactions measured at each intensity, the results follow so closely any relatively simple mathematical curve.

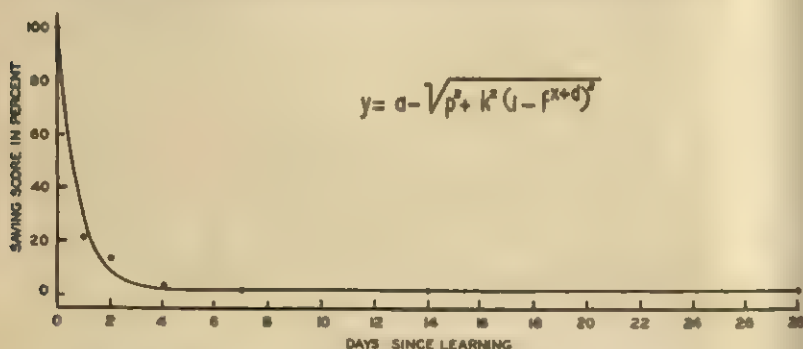


Fig. 7. Curve of Forgetting for Monosyllabic Words
(Data from Krueger (3). $p=.01$; $k=100$; $f=.2679$; $a=101.5$; $d=.01147$.)

The next two curves, Figures 7 and 8, refer to memory. Since, when forgetting is measured by the saving method, the percentage of repetitions saved decreases with time, it is necessary, as in the case of maze learning, to imagine the curve inverted. We thus get a curve showing the increase in forgetting with increase in time. Then, if we wish, we may write the formula so that it fits the curve as usually plotted. Figure 7 shows that our formula well indicates the course of forgetting in the case of monosyllabic words, as determined by Krueger (3), by means of the saving method used in connection with the usual anticipatory method of verbal recall. The case pictured is that in which the original learning of the lists was 100% correct, with no overlearning.

Figure 8 shows the course of learning in memorizing paired associates, each pair consisting of a two-digit number and a letter. Immediately after each exposition of a series, the pupils were asked to write the proper letters alongside a furnished list of numbers. The published data were obtained by averaging the results for the

members of a fifth-grade class. The x values represent the successive trials, and the y values the average number of correct associations. Moore (5), who conducted this experiment, also made a penetrating mathematical analysis of the data and compared the closeness of fit of two theoretical formulae. The better of these, the Gompertz-Courtis formula, he found to give a very satisfactory fit. The present formula, however, gives a considerably better one.

Probably the most crucial test of such a general law as that being here considered is afforded by the data on sensory discrimina-

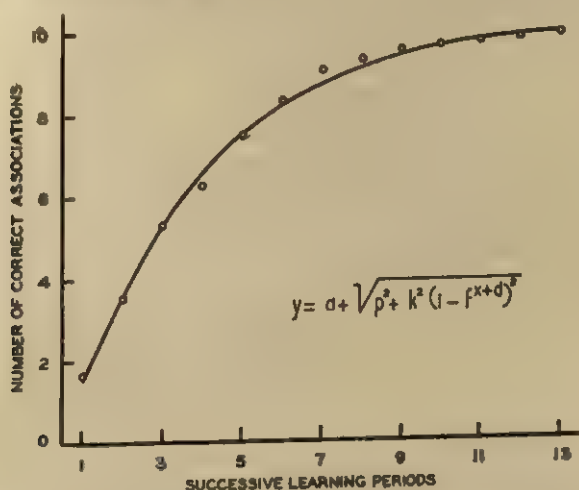


Fig. 8. Learning Curve for Paired Associates (Numbers and Letters)
(Data from Moore (5). $p=8.963$; $k=20.042$; $f=.73153$; $a=-11.7$; $d=1.1$.)

tion designed to test Weber's law. Weber's law deals with two values: first, the magnitude of a standard, designated S ; and second, a magnitude, expressed in the same physical units as the standard, called the just noticeable difference, designated ΔS . There appears to be no response which increases in magnitude with increase in the standard, and yet it is only to such a response that the law here considered could apply. The just noticeable difference, or ΔS , is not such a magnitude, for it is merely a difference between two physical stimuli, namely: the standard stimulus and a stimulus just noticeably different from the standard. Of course, one might drag in the concept of intensity of sensation and consider the sensation to be the response which increases with increase

in the magnitude of the stimulus. Such a procedure, however, would be a departure from the principles here advocated and, further, would lead only to confusion. The difficulty lies in the failure sufficiently to analyze the nature of the measures obtained in a Weber's law experiment. In the first place, it is clear that from such an experiment, at each value given the standard, we obtain a measure of what may be termed the relative discriminial value of the subject's response to the standard. The measure of this relative discriminial value of the response is the relation of the standard to the just noticeably different stimulus—that is, $S/(S+\Delta S)$. This value, $S/(S+\Delta S)$, varies from a minimum of zero to a maximum of 1. It would be 1 in case of perfect discrimination and would approach zero as a limit as discrimination became extremely poor. Were Weber's law true, the curve showing how this value varies with variation in the standard would be a horizontal line. This value is obviously not a measure of the sort of response we are trying to identify, one which increases with increase in the magnitude of the standard. Such a measure may be obtained, however, merely by multiplying the relative discriminial value of the response by S . We therefore define an attribute of response, termed its absolute discriminial value, by the expression S times the relative discriminial value, *i.e.* $S\left(\frac{S}{S+\Delta S}\right)$. This measure of

the absolute discriminial value increases in magnitude with increase in the magnitude of the stimulus. Were Weber's law true, the plot of this value against S would be a straight line rising proportionally to the increase in S . It is this magnitude which has been used as the y value in fitting our formula to data bearing on Weber's law. One may, of course, from the formula for the absolute discriminial value, readily calculate⁷ the more familiar values, ΔS and $S/(S+\Delta S)$. For graphic representation these latter measures are more revealing than the y values from which they are derived and are the ones plotted in the figures here shown (Figs. 9, 10, 11, 12, and 13).

The continuous curve in Figure 9 shows the course of the relative discriminial value of the response, measured by $S/(S+\Delta S)$, as derived from the absolute discriminial values calculated by the

⁷ From the following formulae: $\frac{S}{S+\Delta S} = \frac{y}{S}$; $\Delta S = \left(\frac{S^2}{y}\right) - S$.

formula. On account of the vast range of the x values, it is necessary to plot them logarithmically. Otherwise, the distance between the two values at the extreme right of the curve would have to be no less than 500,000 times the distance between the first two values at the left. This condensation of the curve tends to conceal the excellence of the agreement between calculated and observed values over the upper 99.5% of the entire range of x values. Since the height of the curve over any point on the x axis represents the goodness of relative discrimination, the curve shows well the in-

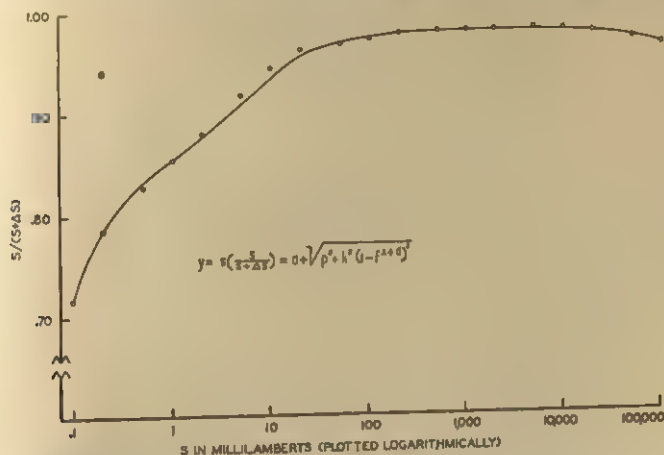


Fig. 9. Brightness Discrimination: Relation Between Relative Discriminal Goodness, $S/(S+\Delta S)$, and Brightness of Standard (Data from König and Brodhun (6). $p=2.66$; $k=3,446,884$; $f=.999999715$; $a=-5.2843$; $d=4.6321$. The values of $S/(S+\Delta S)$ are calculated from y by the formula, $S/(S+\Delta S)=y/S$.)

crease in goodness of discrimination at low x values, with increase in the brightness of the stimulus. When the standard reaches a magnitude in the neighborhood of 10,000 millilamberts, a decrease in relative discriminational goodness sets in. Any law which ignored this decline in relative discriminational goodness at high stimulus magnitudes, as do both Weber's law and all the proposed substitutes therefor, would be systematically in error throughout no less than 90% of the total range of stimulus values employed in the investigation and would show enormous discrepancies, at the highest brightnesses, between the observed and calculated values.

Figure 10 shows the increase in the just noticeable difference, ΔS , with increase in the magnitude of the standard stimulus. The

values of ΔS are derived from the same y values as were those shown in the preceding graph and involve no new solution of the general equation. Both S and ΔS are here plotted logarithmically. The magnitude of ΔS increases from .04 millilambert to 3250 millilamberts as the brightness of the stimulus increases from .1 millilambert to 100,000 millilamberts—that is, by a ratio of a million to one. As may be readily observed, throughout this vast range the calculated values agree very closely indeed with the observed ones.

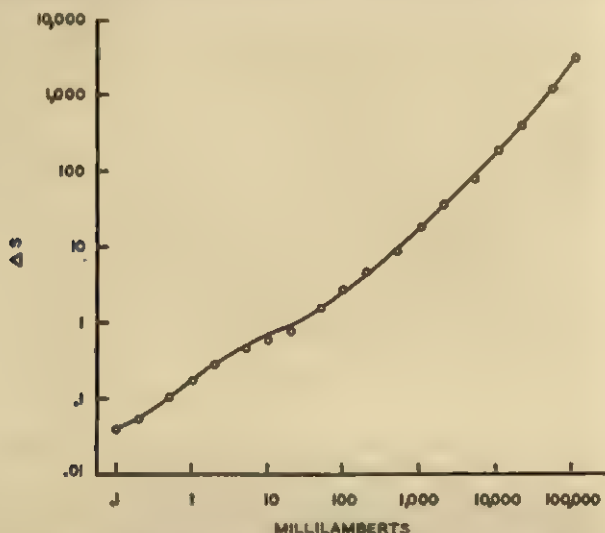


Fig. 10. Brightness Discrimination: ΔS as a Function of the Brightness of the Standard

(The original data are the same as those on which Fig. 9 is based. The values of ΔS are calculated from y by the formula, $\Delta S = (S^2/y) - S$.)

It has been emphasized that the y value which has been fitted in the case of sensory discrimination is the absolute discriminial value of the response. It indicates goodness of discrimination, not intensity of sensation. There is no reason, therefore, why our law should not apply to other forms of discrimination than discrimination of intensities. It quite certainly applies to pitch discrimination, as shown by Figures 11 and 12.

The measurements used are those obtained in the most recent of the numerous investigations of this matter, that by Shower and Biddulph (9). These investigators used a sinusoidal variation in vibration frequency, giving two variations in pitch per second, and

were careful to keep the intensity of tone constant at all pitches. The values plotted in the exposed figure are those for the measure of relative discriminational goodness, $f/(f+\Delta f)$, in which f is the frequency of the standard.⁸ The graph indicates that the relative goodness of pitch discrimination increases with the vibration frequency of the standard up to a rate of nearly 2000 cycles and then slowly decreases.

Figure 12 shows the value of Δf —that is, the absolute just noticeable difference in pitch, when Δf is calculated from the values shown in the preceding figure. On account of the great range in the frequencies of the standards, they have been plotted logarithmi-

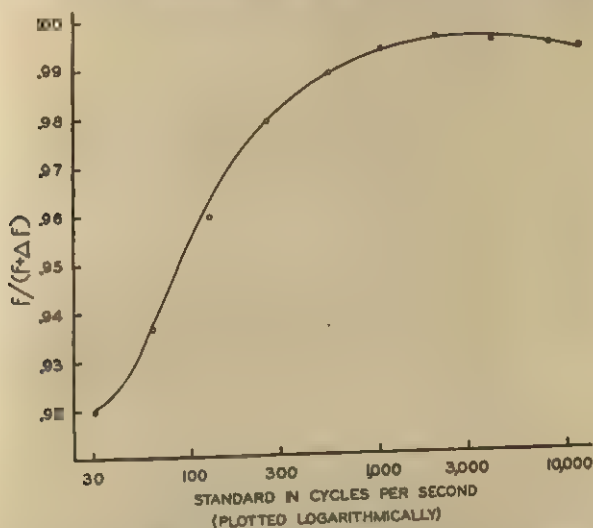


Fig. 11. Pitch Discrimination: Relation Between Relative Discriminal Goodness, $f/(f+\Delta f)$, and Vibration Rate of Standard
(Data from Shower and Biddulph (9). $p=13.7$; $k=1,110,609.5$; $f=.9999991$; $a=-5.33$; $d=0$. The values of $f/(f+\Delta f)$ are calculated by the formula, $f/(f+\Delta f)=y/f$.)

cally. The values of Δf , however, are plotted linearly. The curve shows that in terms of vibrations per second the just noticeable difference at first increases only slightly with increase in the vibration frequency of the standard, but at a frequency of about 3000 cycles begins to increase with great rapidity.

⁸ When the standard varies only in frequency of vibration, it is customary to represent it by f instead of S . The definition of y , i.e. the absolute discriminational value, then becomes $f\left(\frac{f}{f+\Delta f}\right)$.

The last four figures (9, 10, 11, and 12) show the effect of change in an environmental variable upon discrimination. They should abolish forever the notion that psychophysics is a subject apart from the rest of psychology. The activities of organisms constitute the subject matter of all psychology; and when the activity studied happens to be that termed sensory discrimination, we are in the field of psychophysics. The fundamental laws of

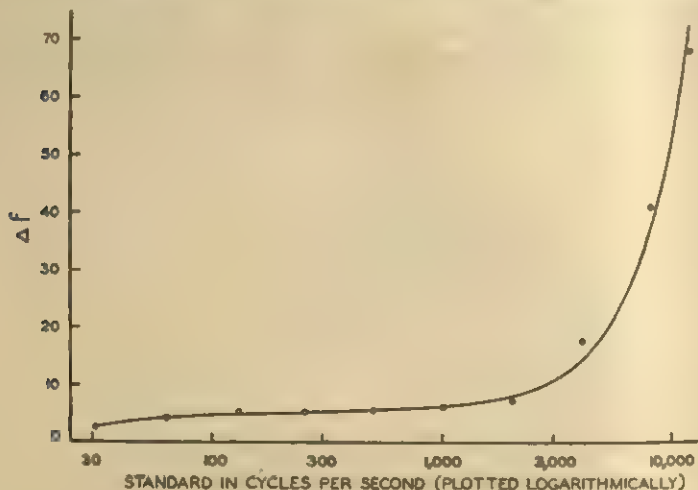


Fig. 12. Pitch Discrimination: Δf as a Function of the Vibration Rate of the Standard

(The original data are the same as those on which Fig. 11 is based. The values of Δf are calculated from y by the formula, $\Delta f = (f^2/y) - f$.)

psychology are laws relating these activities to their determining conditions. It should not be surprising, then, that the fundamental psychophysical law, correctly stated, turns out to be a law which also applies to such activities as maze running by white rats and memorizing paired associates by human beings.

While goodness of pitch discrimination is very largely a function of the vibration rate of the standard, as has been illustrated, it also depends upon the intensity of the standard. Shower and Biddulph (9) studied this matter, and one of their sets of data is represented by Figure 13. It shows the effect upon the just noticeable difference in pitch when, with the pitch of the standard kept constant at 2000 cycles, only the intensity of the sound is varied. As may be observed, the just noticeable difference de-

creases with increase in intensity. We are here a long way from Weber's law. It obviously has no application. There is thus provided a rather striking instance of the value of the reasoning here employed, by which both the pitch and the intensity of the standard are regarded as environmental variables constituting determining conditions of goodness of pitch discrimination. It then becomes possible to formulate the relation between either of these

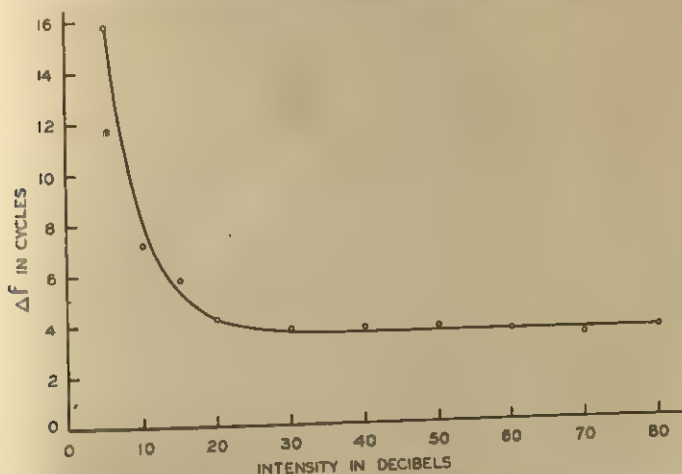
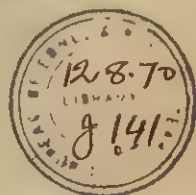
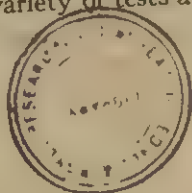


Fig. 13. Pitch Discrimination: The Just Noticeable Difference in Pitch (Δf) as a Function of the Intensity of the Stimulus
(Data from Shower and Biddulph (9). The values of Δf are calculated from y by the formula, $\Delta f = (f^2/y) - f$. $p = .1$; $k = 1996.4$; $f = .82007$; $a = -.1$; $d = 20.7$. The variable x is intensity measured in decibels.)

environmental variables and goodness of pitch discrimination by one and the same general law.

In the case of the data so far considered it is possible to assume that the psychological attribute has been measured in units which are objectively equal, or approximately so. By this is not meant that equal steps in score indicate equal steps in ability, a far more theoretical question, but simply that the primary units are equal, or very nearly so. Thus, a reaction time of two seconds is twice as long as one of one second; two errors made in a maze are twice one error; and a just noticeable difference of two millilamberts is twice as large as a difference of one millilambert. In the case of the measurement of intelligence, however, accomplished ordinarily by a motley variety of tests and types of scores, somehow



amalgamated into one total score, there exists no guarantee of approximate constancy in the unit of measurement, whether the total score be in terms of mental age or in terms of some total number of points. The only means of obviating this difficulty is the employment of an absolute scaling technique. Since these techniques all rest upon one or more assumptions, the validity of

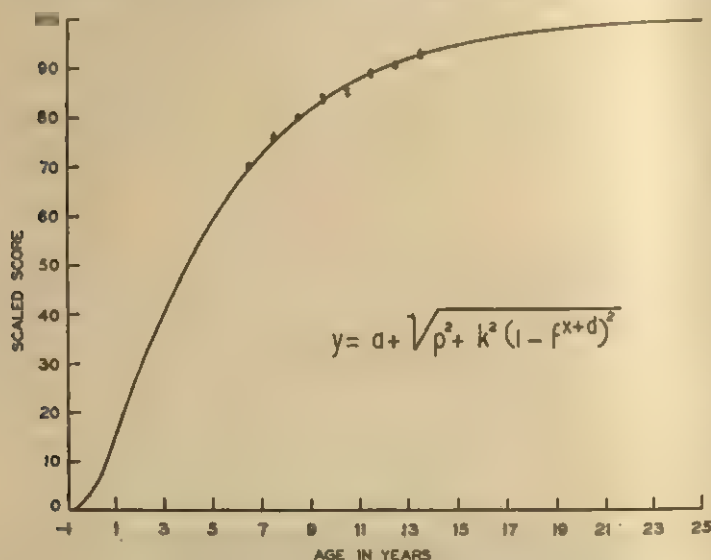


Fig. 14. Intelligence Growth Curve

(Crosses represent data from Richardson and Stokes (8), and circles, data from Arthur and Woodrow (1). $p=43.16$; $k=136.48$; $f=.8181$; $a=43.16$; $d=.75$.)

which is still not fully determined, we shall present two sets of data scaled on somewhat different assumptions.

One set of data was obtained by Richardson and Stokes (8) and scaled by them by means of the well-known method devised by Thurstone. The other set of data, obtained many years earlier by Arthur and Woodrow (1), was scaled by a different method devised by them. This latter method is one which aims merely to weight the scores made in the various tests, before pooling them into a single score, according to their ability to differentiate children of any one chronological age from children of adjacent ages. Each set of data covers the same range in years—namely, $6\frac{1}{2}$ to $13\frac{1}{2}$, inclusive—and each was obtained by testing all the children

in a given community. Though the actual tests used in the two investigations were entirely different, and the populations tested belonged to different nations, both sets of data conform exceedingly well with the same general law, the law of the relation between environment and response which has now been shown to apply to widely different situations. In fitting this law to the present data, one theoretical condition was imposed, namely: the growth curve of intelligence should take its origin nine months before birth. It has also been assumed that the degree of intelligence present at the age of minus nine months is zero, but any other amount could be assumed without in the least changing the shape of the curve.

In the case of both sets of data, the absolute zero and the size of the units have been so chosen⁹ that the scale has a value of 100 at the theoretical upper limit of growth. Figure 14 shows a curve fitted under these assumptions to the data of Arthur and Woodrow. This same curve appeared to fit so well the data of Richardson and Stokes that no new values for the parameters were calculated. It is obvious that the two sets of data are in excellent agreement; in fact, I fear they so nearly coincide that it is impossible to distinguish the small circles representing the data of Arthur and Woodrow from the crosses representing the results obtained by Richardson and Stokes. It should hardly be necessary to emphasize that each set of data should be regarded as indicating increase with age in the particular pool of tests employed, rather than increase in intelligence, with intelligence defined by reference to some criterion reached by factor analysis or by any other preferred definition. The curve could be termed an intelligence growth curve only in so far as the scores, throughout their range, were regarded as valid measures of intelligence.

In spite of the highly theoretical nature of the growth curve which has been drawn, it may be of some interest to note the percentage of ultimate growth shown by the average child at various ages. At birth he has reached 4%; at age 1, 16%; and at age $6\frac{1}{2}$, when he is in the first grade of the primary school, he has reached no less than 70% of his score at maturity.

⁹ This was accomplished in the case of the data of Arthur and Woodrow by multiplying the yearly means by .6535 and adding 70.03; and in the case of the data of Richardson and Stokes, by multiplying by 7.581 and adding 76.39. Multiplication of the scaled norms is permissible, since it simply changes the size of the unit; and addition of a constant is permissible, since the zero point of the scaled score is at best an arbitrary one.

The illustrations which have been presented clearly indicate the possibility of generalizing by a single law the findings in numerous widely different experimental fields. It would be foolhardy, however, to claim that the law here enunciated should be considered as stating the ultimate truth. Certain complications may be foreseen arising from the multiplicity of types of units. For example, if the law holds for scaled intelligence test scores, it is not likely to hold for all the widely different, often ambiguous, types of scores now in use. A similar problem exists with respect to the type of unit used to measure the environmental variable, particularly in the case of intensity measurements. One or two rules, setting up certain criteria concerning types of scores, will be needed before the law may be freely employed. On the other hand, the fact of the great generality of this law, as well as its substantial accuracy, is believed to have been established.

It is believed, also, that this law constitutes a demonstration of the usefulness of the viewpoint maintained during its derivation. This viewpoint is one from which it is possible to examine the empirically established relations between psychological reactions and environmental variables directly, without first making detailed hypotheses concerning the internal happenings which may be imagined to bring about these relations; by means of such examination to determine what the relations existing in different situations have in common; and then to formulate the common features as general quantitative laws. It does not require much imagination to foresee the immense value of such generalizations. A few interrelated general laws should go far toward bringing order out of chaos in the whole field of quantitative experimental psychology.

APPENDIX I

OBSERVED AND CALCULATED VALUES FOR FIGURES 1 TO 14

x	y	y'	x	y	y'	x	y	y'
Figure 1			9	10.83	10.66	4	4.00	4.25
1	.17	.17	10	11.00	10.88	5	3.35	3.46
2	1.75	1.80	11	10.83	11.03	6	2.85	2.86
3	4.17	4.36	12	11.25	11.13	7	2.60	2.41
4	6.33	6.49				8	2.58	2.06
5	8.00	8.04	Figure 2			9	2.04	1.80
6	9.25	9.11	1	7.70	7.70	10	1.95	1.61
7	10.00	9.84	2	6.58	6.44	11	1.42	1.47
8	10.42	10.33	3	4.86	5.23	12	1.53	1.36

OBSERVED AND CALCULATED VALUES FOR FIGURES 1 TO 14

[illegible]

APPENDIX I (cont.)

OBSERVED AND CALCULATED VALUES FOR FIGURES 1 TO 14

x	y	f	x	y	f
Figure 9			62	.9365	.9376
.1	.7163	.7160	125	.9596	.9628
.2	.7886	.7860	250	.9792	.9796
.5	.8278	.8316	500	.9891	.9890
1	.8547	.8548	1,000	.9939	.9939
2	.8803	.8766	2,000	.9964	.9960
5	.9184	.9090	4,000	.9956	.9964
10	.9450	.9334	8,000	.9949	.9953
20	.9629	.9576	11,700	.9942	.9939
50	.9690	.9690	Figure 12		
100	.9738	.9754	31	2.706	2.68
200	.9780	.9788	62	4.204	4.13
500	.9823	.9809	125	5.262	4.83
1,000	.9818	.9815	250	5.300	5.21
2,000	.9823	.9817	500	5.500	5.54
5,000	.9837	.9815	1,000	6.100	6.17
10,000	.9824	.9809	2,000	7.200	8.02
20,000	.9799	.9795	4,000	17.600	14.34
50,000	.9747	.9754	8,000	40.800	37.79
100,000	.9685	.9685	11,700	67.860	72.36
Figure 10			Figure 13		
.1	.0396	.0397	5	15.80	15.92
.2	.0536	.0545	10	7.20	8.15
.5	.1040	.1012	15	5.80	5.29
1	.170	.1699	20	4.20	4.23
2	.272	.2816	30	3.80	3.70
5	.444	.5005	40	3.80	3.62
10	.582	.7135	50	3.80	3.61
20	.770	.886	60	3.60	3.61
50	1.60	1.60	70	3.40	3.61
100	2.69	2.52	80	3.60	3.61
200	4.50	4.34	Figure 14		
500	9.0	9.75	Arthur-Woodrow		
1,000	18.5	18.8	6.5	70.03	70.05
2,000	36.0	37.2	7.5	75.65	75.40
5,000	83.0	94.0	8.5	80.03	79.84
10,000	179.	195.0	9.5	84.21	83.47
20,000	410.	418.0	10.5	85.71	86.45
50,000	1300.	1260.	11.5	89.18	88.90
100,000	3250.	3250.	12.5	90.42	90.92
Figure 11			13.5	92.25	92.56
31	.9197	.9203			

APPENDIX I (cont.)

OBSERVED AND CALCULATED VALUES FOR FIGURES 1 TO 14

x	y	\bar{y}	x	y	\bar{y}
Richardson-Stokes			9.5	83.21	83.47
			10.5	85.25	86.45
6.5	70.53	70.05	11.5	88.45	88.90
7.5	76.39	75.40	12.5	90.92	90.92
8.5	79.78	79.84	13.5	93.06	92.56

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A SECOND REVIEW OF 16-MILLIMETER FILMS IN PSYCHOLOGY AND ALLIED SCIENCES

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Since the publication of the first review of psychological films (257) several important advances have been made in the field of 16-millimeter instructional motion pictures. The more important developments include: (a) a steady increase in the number of talking films, (b) the production of color film duplicates, (c) an influx of foreign educational films of high merit, (d) the release of many Hollywood theatrical films for classroom use, (e) evaluations of films by competent previewing panels, and (f) the establishment of several psychological film libraries, including the Psychological Cinema Register (267), Warden and Gilbert Films (276), and the College Film Center (262).

Although color in 16-millimeter films is as old as sound, only original color prints have been extant, which necessarily limited the use of this type of film. Recently, satisfactory color duplicates have begun to appear, and, though far more costly than black-and-white duplicates, they mark a significant step in the evolution of the educational film. With the union of natural color and sound, striking realism in classroom films now waits only on the perfection of apparatus for projecting stereoscopic motion pictures in such a way that the natural color is retained.¹

With the large number of instructional films produced in this country and the steady flow of pictures from abroad, the average user's task of selecting the better films is not an easy one. The scanty and oftentimes biased information given in commercial film catalogs is of little assistance. In England, careful evaluations of psychological and other classroom films by educational experts have been provided since 1933 by the British Film Institute through its *Monthly Film Bulletin* (261). Following in part the example of the British Film Institute, the American Association

¹ At least three companies, the Society for Visual Education (272), Leitz (252), and the Three Dimension Corporation (275), distribute projectors and Polaroid materials for projecting and viewing tridimensional still pictures in natural color. There are no serious obstacles to the use of similar techniques for showing stereoscopic cinematographs. Research on the production of the stereoscopic effect from a single strip of polarized film already is well under way (269).

of School Film Libraries (255) and the H. W. Wilson Company (263) now offer critical reviews and appraisals of instructional films in their annual catalogs. As the coverage is extended, these catalogs undoubtedly will become the standard source books of classroom films.

Educators have long been aware of the instructional merits of many theatrical films. Until recently, however, Hollywood producers have been reluctant to permit their pictures to be used as teaching aids. Through the efforts of a number of groups, including the American Council on Education (252), the Progressive Education Association (271), Teaching Film Custodians (274), and Films, Inc. (266), hundreds of one-reel excerpts and full-length feature pictures are now available for classroom use with few restrictions. The best-known series has been prepared by the Commission on Human Relations of the Progressive Education Association and contains 55 excerpts from well-known feature films. These fictional pictures are cryptically edited to illustrate specific social problems that arise in child training, marital relationships, club contacts, racial conflicts, mob actions, and allied group situations. Their use is legally restricted to regularly established classes or study groups in educational institutions and organizations within the continental United States. Each application for rental of the pictures must be made on the legal form provided or approved by the Commission and mailed to the film library serving the particular territory.² Since each of these films is described fully in the catalog and study guides of the Association (271), the individual summaries are omitted here.

This review gives a survey of only those psychological films which have appeared since 1938 or were omitted through oversight from the first summary (257). In a few instances major revisions of old films or the withdrawal of a block of films from circulation are cited. In the bibliography specific information about each film is provided, including the names of producer and distributor, the

² The six film libraries distributing these pictures and their respective districts are as follows: Free Film Service, School of Education, Boston University, 29 Exeter St., Boston (New England); New York University Film Library, 71 Washington Square, New York City (New York area); University System of Georgia, 223 Walton St., N. W., Atlanta (Southern States); College Film Center, 59 E. Van Buren St., Chicago (Midwestern States); Bureau of Visual Instruction, University of Oklahoma, Norman (Southwest); Department of Visual Instruction, University of California, Berkeley (Pacific Coast).

title, length, date of production, rental and sale costs, and the kind of each film, *i.e.* monochrome or color, silent or sound.

HISTORY AND PRODUCTION OF FILMS

The Museum of Modern Art Film Library (270) distributes two series of films, grouped into 11 programs, which portray the advance of the theatrical film in America. A fine survey of these programs as well as the work of the Film Library is provided in the film, *Movies March On* (186). A complete history of photography with emphasis upon the development of the cinema is delineated in *Evolution of the Motion Picture* (18). The contributions of Da Vinci, Kirther, Rodet, Plateau, Daguerre, Sellers, and Edison, among others, are reviewed. Old-fashioned projection lanterns are shown in operation. The terminal sequences review the steps which led to the perfection of the modern talking picture. A short history of silent motion-picture entertainment is given in the film, *Silver Shadows* (58). The early photographic discoveries of Talbot and Armat are depicted and explained in a Gutlohn film (2). A related picture, *How Motion Pictures Move and Talk* (32), makes plain the mechanical, electrical, and visual principles through which modern sound films are made possible.

A series of six "technique" films have been carefully prepared by the Harmon Foundation for aiding the amateur cinematographer. The titles include *How To Use Your Camera* (222), *Common Mistakes and How To Correct Them* (218), *Exposure and Exposure Meters* (219), *Film Editing* (220), *How To Use Filters* (221), and *Lenses and Their Uses* (41). A careful study of these six films, together with the *Bulletin* article by Stone, Valentine, and Miles (273), would seem advisable for those who, for one reason or another, must produce films without professional assistance.

DEVELOPMENT OF BEHAVIOR

Heredity

Two films dealing with heredity in animals (129) and man (130) have been arranged by Huxley and Hewer for Gaumont-British Instructional Films Bureau. The first film on animals is a two-reel subject which surveys the mechanisms and principles of heredity. By means of animated diagrams the cell nuclei at the time of condensation of chromatin and the formation of chromosomes are shown. Additional schematic diagrams illustrate the processes of mitosis, meiosis, and the formation of the zygote. The independent

segregation of more than one pair of genes involved in a cross is shown by interbreeding long-haired albino rabbits with short-haired black ones. When two allelomorphic pairs affecting the same structure are present, gene interaction occurs. The film shows that rose-combed fowls crossed with pea-combed fowls produce walnut-combed birds. The commentary fails to explain that the Mendelian ratios, neatly shown in the film, are theoretical expectations. It also fails to point out in the poultry crosses that the single-combed fowl does not always breed true, but frequently gives rise to a split comb. The second picture, treating of heredity in man, is designed as a continuation reel to the animal picture. Actually, there is little, if any, connection between them. A number of superior British genealogies are presented, from which the viewer is led to infer that heredity plays a leading role in physique, musical talent, and artistic abilities. These pedigrees are contrasted with another in which a large share of the offspring is either feeble-minded or crippled. There is no comment on the fact that different forms of mental defect may be transmitted in different ways or that some are not inherited at all. The Eugenics Society of London, after re-editing and condensing the animal film, added it to the human film and distributed both under the title, *From Generation to Generation* (133). For teaching purposes the original version of the animal film is preferable. In spite of the criticisms, these films are superior to anything on heredity produced in this country. The one-reel picture by Strandskov (224), although well photographed, is brief and oversimplified. It shows monohybrid and dihybrid crosses in cattle and guinea pigs, respectively, which are used to illustrate the Mendelian principles of dominance, recession, and segregation.

Antenatal and Early Postnatal Growth

A film on embryology, produced by the U. S. Department of Agriculture (30), won international recognition for its fine cinematic treatment. Through micromotion pictures, supplemented by animated diagrams, the film traces the development of the rabbit embryo from the fertilization of the egg to the twenty-second day of embryonic life. Lewis and Gregory (161, 162) and Eastman (16, 25) also have pictures which portray the early development of the rabbit egg. Lewis and Hartman (163) have recorded cinematographically the early divisions (two- to eight-cell stage) of the living monkey egg. The film by Strandskov (225) presents in an elemen-

tary form the processes of fertilization, cleavage, fetal growth, and parturition of the pig.

In the fine British film on the development of the chick (132) the internal structure of the egg is explained diagrammatically, and this is followed by microphotographs which show growth from the six-hour stage to hatching. The formation of the blastoderm, primitive streak, neural groove, brain, foregut, heart, eyes, and area vasculosa is seen in detail. In a second reel the rapid growth of the whole embryo, the development of wings, feet, beak, and feathers, and the use of the allantois and yolk sac are shown clearly. Finally, hatching is seen in detail, and the subsequent growth of the chick to maturity is shown in a series of photographs taken at various stages from one hour to eight months. Two related pictures of merit trace the development of the trout (87) and the tadpole (120).

Warden and Jackson (241) have photographed the successive developmental phases of the white rat from birth to three months of age. The sensory and motor capacities of the young plus the maternal care and nesting behavior of the adults are shown.

Additional films which deal wholly or in part with prenatal and early postnatal development include *How Life Begins* (31), *Living World* (44), *Leaping Through Life* (77), and the *Gift of Life* (28). The last picture provides, among other things, a rather complete and accurate presentation of the biology of sex.

PLANT AND ANIMAL BEHAVIOR

With time-lapse photography the slow growth-movements of plants occurring over a period of hours or days can be presented on the screen in a few seconds. The visual effect is a startling illusion. In the film, *Plant Power* (142), the tendrils of vines are seen waving back and forth until a supporting object is touched, when the tendrils quickly form a tight coil. The tender shoots of lily-of-the-valley press against a plate glass that covers them. Slowly the shoots push the glass aside and in their rapid growth appear to wave triumphantly in the air. The reactions of plants to light, air, gravity, and anesthetics are demonstrated in the film, *Sensitivity of Plants* (143). Among other things, it shows vividly the differential reaction of the sensitive plant, *Mimosa pudica*, to weak and strong stimulation. For additional films of this kind, the reader should consult the *Educational Film Catalog* (263).

A generous number of excellent pictures are available on the

natural behavior of marine animals (246, 247, 248), insects (27, 140, 141, 212, 227, 245, 249), and unicellular organisms (48, 62, 131). Representative films in this group are the photographic studies of ants and bees by Kaufman (140, 141), spiders and marine organisms by the Woodards (247, 248), and the paramecium by Huxley and Hewer (131). Many similar films are currently listed in the *Educational Film Catalog* (263).

The evolution of locomotor and prehensile organs is traced in a Strand film, *Fingers and Thumbs* (148). Pictures, diagrams, and an informative commentary present morphological relationships between the fins of fish, the vestigial claws of reptiles, the wings of birds, and the limbs of various mammals. Hoofs, claws, flippers, and hands are shown in rapid succession. It is pointed out graphically that the hands of some infraprimates and all primates have been released as locomotor organs and at times are used as prehensile organs. The hand of the chimpanzee is then shown, and its function is indicated in a series of splendid scenes depicting a "chimp" unlocking a padlock, using a mug and spoon, striking a match, lighting the cigarette of the keeper, and wiping its body with a towel. The film ends with sequences showing the hands of a human infant and adult. This picture is well suited for instruction in comparative psychology and related courses.

The natural behavior of gibbons and orangutans is portrayed in a film by Carpenter (81). A second picture (80) exhibits the behavior of free-ranging rhesus monkeys in the colony on Santiago Island. Feeding, play, grooming, dominance relationships, and sexual behavior are shown. The picture by Legg (147) traces individual and social development among different species at the primate level. Comparisons are drawn from the natural activities of baboons, gibbons, orangutans, chimpanzees, gorillas, and men.

A picture by Billingslea (75) differentiates between emotional and nonemotional rats. The emotional animals tend to be more active, curious, and persistent as long as the situation is a familiar one. Constitutional differences in dogs are depicted in a film by James (137). Conditioned avoiding reactions are established in both pure-breed and hybrid animals. The film clearly reveals the physical form and behavior that go with excited, inhibited, and variant types of animals.

Mowrer and his associates, in an ingenious series of experiments, have demonstrated a variety of social complications which result from competition among rats. In an initial film (202) the

difference between groups of rats that have been reared together and in isolation is shown. The former group compete vigorously when a pellet of food is dropped into the cage. The second, or isolated, group must learn the knack of competition. Eventually, there emerges with both groups a kind of coöperation or sharing which permits more rapid eating by all the rats. When the situation is altered so that one member can escape with the food, sharing immediately disappears. In a second film (203) each of three litter-mate male rats learns to "make a living" by pressing a bar which releases a pellet of food. The bar is now moved to the far end of the apparatus so that more "work" must be done for the same "pay." By placing three rats in the apparatus together, a "social problem" arises: the animal that "works" has the least chance of securing what he has "produced." Total "production" rapidly declines, and during the "depression" the animals compete at the food box for food that is not there. Finally, the animals, ravenously hungry, "attack" the bar. One animal learns that by rapidly activating the bar and dashing to the food box he sometimes can obtain a pellet. His litter mates eventually become satiated, and the problem is solved. One rat continues as the worker, and the others become completely parasitic: a class society emerges. In a third film (204), three rats that have lived together in an "economy of abundance" are placed in a small glass cell and allowed to become hungry. When bits of food are introduced, there is active competition, but little fighting. As hunger increases, the competition gives way to savage fighting and a dominance hierarchy emerges. The dominant and intermediate rats fare well, but the subordinate rat eats hesitantly, even when alone, and quickly drops food when other animals are introduced. The film explains that "personality typing" based on this kind of social experience seems to be relatively permanent. The quality of photography and composition in this film is below the standard set by the first two.

INFANT AND CHILD BEHAVIOR

A silent picture prepared by Gesell (102) shows in fine detail the procedures for developmental examinations. Critical transformations in infant behavior are delineated in a series of 24 short, carefully edited, normative films (101) which deal with ball, bell and cup behavior, cup and cubes, cup and spoon, consecutive cubes, dangling ring, formboard, massed cubes, mirror, paper and crayon, pellet, pellet in and beside bottle, performance box, prone

behavior, rattle, rattle and string, ring, string and bell, sitting, spoon behavior, standing, stair climbing, supine behavior, and tower building. The patterning of prone behavior is dealt with at greater length in a separate film (100). The tonic neck reflex (103) likewise is depicted separately in its morphogenetic and clinical significance. The individuality in infancy (99), as well as clinical case studies of developmental deviations (98), is shown with characteristic thoroughness.

McGraw (168) has edited a film on crawling and creeping to illustrate the gradual expansion of neuromuscular control of one infant in the attainment of a well-coördinated palm-knee performance. The age period covered is from neonatal crawling movements until integrated creeping is well established at the age of 12 months. The development of erect locomotion (177) is illustrated in a pair of one-reel films. The first reel deals exclusively with the technique of photographing dots placed at selected points on the body. The paths of the dots on the film correspond to the spatial movements of bodily members. The second reel is a longitudinal study of one subject, demonstrating the sequential changes from reflex-stepping phase until the child has attained a well-integrated gait. In a picture of the Moro embrace pattern, McGraw (170) points out that the characteristic response in the newborn is a flooding of all motor segments caudal to the midbrain. With increase in age, the intensity of the response diminishes until all that is left is a slight body-jerk. Characteristic reactions of the newborn infant are surveyed in a general film on reflex behavior (178) and in specific films dealing with grasping (180), swimming (181), the plantar response (169), and postural adjustments to an inverted position (176). Additional films portray the maturation of neuromuscular mechanisms which operate in the assumption of sitting and erect postures (173, 174), the achievement of erect locomotion (175), the perfection of reaching-prehensile reactions (172), and the changing reaction of an infant to a pin prick (171). A final film (179) compares the reflex swimming movements in the newborn of different species. A neonatal rat, opossum, rabbit, guinea pig, kitten, monkey, and human all exhibit striking behavioral similarities when placed in the water for the first time.

Many of the films by Lewin and his associates have been either withdrawn from circulation or re-edited. The pictures now available are *The Child and the Field Forces* (156), *Walking Upstairs for the First Time* (158), *Field Forces as an Impediment to a Perform-*

ance (157), *Level of Aspiration in Young Children* (159), and *Experimental Studies in Social Climates of Groups* (160). The last film, which is the only one not listed in the first review, illustrates reactions of grade-school children within certain social groups, the psychological structures of which are democratic, autocratic, and laissez-faire. Differences in aggression, in-group conflicts, and allied social interaction are brought out clearly in the film.

A series of five films dealing with successive steps in child care and training have been produced by Hill. The titles of the films describe their content and age level: *Before the Baby Comes* (121), *The First Year* (123), *The Child Grows Up* (122), *Life of a Healthy Child* (124), and *Road to Health and Happiness* (125). Advice to mothers in the care of their newborn infants is provided in the film by Tollefson (228). The Wisconsin Board of Health has sponsored three films entitled *Judy's Diary Series* (40, 9, 47). The first reel presents the feeding and physical care of Judy at 6 months of age; the second depicts the development of the child from 9 to 18 months; and the third shows Judy at 2 years. The feeding, care, and incidental social relations of the Dionne quintuplets are illustrated in a Gutlohn film (53). Some aspects of the emotional relations between parent and child are dealt with in a film by Marvin (188). Early structural abnormalities and injuries to the newborn are treated in two films entitled *Injuries of the Newborn* (85) and *How We Get To Be Human* (145).

RESPONSE MECHANISM

Receptors and Receptive Processes

(a) *Vision*. The structure and function of the eyes are depicted in several silent and sound films (20, 21, 23, 34, 35, 56). The best pictures in the group are two Eastman films (20, 21) and a sound picture by Knowledge Builders (34). This last film presents a brief introduction to ocular anatomy and traces the path of light through the eye to the retina. The mechanism of accommodation is fully explained with beautiful illustrations and animated diagrams.

The physical basis of color is shown in striking fashion in the free film, *Curves of Color* (15). The level of this picture is such that it can be used effectively in either elementary or advanced classes. It explains Newton's experiments with the spectrum, and a diagram shows the entire electromagnetic spectrum. The relation of color to wave length and to reflection or transmission of light waves

is illustrated. The problems involved in color matching are explained, and the use of the new recording photoelectric photometer to give a graphic representation of color components is shown.

The scope of the national sight-saving movement is surveyed in a film (52) which reviews the everyday precautions to be followed in the home, school, and industry. The picture provides several graphic examples of visual defects arising from ignorance and neglect. External diseases of the eye and routine orthoptic training with motor anomalies are exhibited in a pair of films (19, 49) which have been edited more for professional than for classroom use.

(b) *Audition*. The nature of the auditory stimulus is superbly treated in a sound film, *Vibratory Motions and Waves* (61). By means of slow-motion photography, animation, and appropriate sound effects, the concepts of wave length, phase, crest, trough, nodes, antinodes, condensation and rarefaction, and transverse and longitudinal waves are vividly presented. A related film (60) briefly demonstrates the physical correlates of pitch and loudness.

The structure of the ear is explained in the film, *How We Hear* (33). The relationships between pressure variations in the air, the action of the ossicles and the endolymph, and the initiation of auditory impulses are shown in considerable detail.

The story of the hard-of-hearing is told in a commercial film sponsored by Western Electric and produced under the direction of Fletcher (92). A section of the film demonstrates the use of audiometric tests for measuring the extent of hearing loss.

(c) *Static Sense*. The importance of the static sense in behavior is well illustrated in the film by Neff, Smith, and Kappauf (205). The behavior of cats following the transection of first one and then both vestibular nerves is shown. With unilateral impairment the animals roll, move the head, and turn in the air towards the side of the injury. Bilateral sectioning is followed by forced rotary movements of the head, hyperextension of the limbs, disturbance of the righting reaction, and inability to stand. In time, the severity of the symptoms decreases until the cat can walk. A cinematic review of the standard clinical tests of static function in human subjects has been prepared by Lyman (167).

Nervous System

The evolution of the nervous system, including the structure of nerve cells, spinal cord, and brain, is portrayed in nine reels of a

Russian film (209). A briefer treatment of the same subject matter is presented in a silent film distributed by Carter (7). A picture by Sarnoff (211) shows the gross topography of the human brain. The method of recording action currents from the human brain and the types of electroencephalograms found in normal, functional, and organic states are depicted in the picture by Bennett and Cash (73).

In a series of research films on cats, Masserman demonstrates the role of the hypothalamus as a nervous center for a variety of sympathetic reactions suggestive of fear and rage. The first film (193) shows that faradic stimulation of the hypothalamus induces such responses as mydriasis, erection of the hair, sporadic vocalization, and certain "emotional" attitudes. Total destruction of the hypothalamus (192) causes persistent stupor, which may give way to somewhat disorganized manifestations of rage when the animal is annoyed or restrained. Two additional films (191, 194) in natural color show the sensitization of the hypothalamus by injections of the analeptic drug, picrotoxin, and the reaction of the heart to electrical stimulation of the hypothalamus. The first film shows that the drug increases hypothalamic reactivity as evidenced by profuse salivation, alternating periods of wailing and panting, dilated pupils, extruded claws, a lashing tail, and a frenzied darting about the cage. The injection of a solution of metrazol into the hypothalamus induces a syndrome of sympathetic and motor reactions resembling a frenzy of rage and fear (190). Further experiments demonstrate that subintoxicant doses of alcohol have a mildly stimulating effect on both the cortex and the hypothalamus (199). Large injections, however, diminish the reactivity of the cortex, but alter only slightly the motor and sympathetic responses of the hypothalamus (189). These experiments as a group point to the conclusion that the hypothalamus is not *the* nervous center for emotion, inasmuch as direct stimulation of it releases only mimetic reactions that are stereotyped, nonadaptive, and shammed. Additional evidence for this position is contained in the films which are reviewed in a later section on *Experimental Neurosis*. Although these films are of great importance, prospective users should realize that they are technical research pictures and are not easily adapted to instruction in elementary psychology.

Ablation of the entire frontal areas of the cortex in cats abolishes the placing and hopping reactions, as is demonstrated in the film by Smith (214). The animals are practically unable to learn a

complex habit, such as pulling a string for a ball which in turn can be used to secure food. Removal of the visual cortex (215) does not impair pupillary reflexes, righting reactions, and optic pursuit movements. However, visual placing reactions are disturbed, and it is shown that the animals avoid obstructions with difficulty. Significantly, they also lose the ability to discriminate brightness under conditions of light adaptation, but learn to discriminate with low illumination.

For the study of human subjects with cerebral lesions, Halstead (112, 113, 114, 115) reviews several qualitative criteria which can be used advantageously, including tests of stereognosis, visual fields, social behavior, and response equivalence.

Hulin and Moore (128), working with the nervous system of an invertebrate organism, show the behavioral antagonisms which result when the nerve ring of the starfish is severed.

Effectors and Levels of Response

The sound film, *Endocrine Glands* (79), suggests more by its title than it presents. The loci and partial functions of only four glands are portrayed: the parathyroids, thyroid, pancreas, and pituitary. Experiments with mice and a goat are used to demonstrate that the secretion of the thyroid influences oxygen consumption and that of the parathyroids, the calcium content of the blood. The manufacture and human use of insulin is shown sketchily. The film terminates with a series of animated diagrams which bear on the importance of pituitary hormones in ovulation and lactation. Since it neglects the role of the glands in growth and motivation, this film will find little use outside elementary classes in physiology.

The joint control by the endocrine and nervous systems of color changes in fish is nicely illustrated in a Rutgers film (13). The killifish, *Fundulus*, is placed on blue, black, white, and yellow backgrounds. In each case the skin pigment corresponding to the predominant color migrates, while the other pigments remain obscure and concentrated in the chromatophores. With the squid, *Loligo*, on the other hand, the pigment is contained in elastic sacs which are changed in shape and area by muscular contraction. In this case the color changes are evoked solely by nervous impulses which activate the muscular fibers.

A film that has interesting implications for the nature of nervous organization has been prepared by Girden (107). Puppies are curarized, and in the drugged state a conditioned flexion of the

semitendinosus muscle to a bell is established. Upon recovery from the drug it is shown that the conditioned response cannot be elicited. However, when the puppy is recurarized, the conditioned response reappears without reinforcement. A title in the film states that, conversely, a conditioned reaction set up in a normal animal can be evoked in successive normal states, but disappears with the administration of curare. From these facts the hypothesis is offered that curare produces a change in the level of nervous organization, a functional decortication. Although this film contains a wealth of pertinent material for general psychology, it is doubtful whether tender-minded elementary students can bear the operative sequences.

A short survey of autonomic activity is provided in the film by Lindsley and Sassaman (164). The initial sequences show a hirsute man who can raise the hairs all over his body "at will." On a signal from the experimenter the hair on his arms or legs or any spot is raised and lowered. Accompanying the "voluntary" pilomotor response is a general sympathetic discharge indicated by increased heart rate, blood pressure, rate and depth of respiration, galvanic skin response, dilation of the pupils, and changes of the brain potentials from the premotor area. All these reactions are demonstrated with appropriate laboratory apparatus. The film closes with a final hair-raising episode.

LEARNING³

An extensive photographic record of the forms of animal learning is provided in the instructional films by Smith and Kap-
pauf (216, 217). The cat is used as the experimental animal throughout. The first reel shows (a) three kinds of conditioned avoidance reactions and (b) problem-solving with strings and a ball that is pushed into a slot. The second reel deals with (c) discrimination learning involving visual and auditory patterns and (d) compound learning as exemplified by the acquisition of alternation and token-reward habits. A separate picture (213) traces the

³ In the first review, a film, entitled *The Intelligence of White Rats*, by Shepard was attributed erroneously to Maier. A film by Maier (183) with the same title was omitted from the review. This film shows the rat learning the paths of a complex situation made up of tables and elevated pathways. When the route to the food is later interrupted by the removal of a section of pathway, the rat adapts by descending to the floor, crossing the gap, ascending to the pathway, and thus reaching the food. This adaptation shows the ability of the rats to grasp the situation as a whole.

acquisition of the token-reward habit in the cat. Each of four animals is trained to press a string which releases a rubber ball into its cage. The ball in turn is rolled into a chute which removes a barrier to the food pan. The animals quickly learn the primary and secondary habits. For a few trials one cat takes the balls directly from the magazine. The bewilderment of this animal when an accidental, repetitive pressing of the string releases a flood of balls into the cage is neatly shown.

Gordon (109), working with free-ranging, golden-mantled ground squirrels, obtained some rare pictures of these little animals in puzzle-box and string situations. Peanuts are suspended out of reach, and the film shows the repeated and rather ingenious attacks on the problems by the squirrels. Although the film has not been carefully edited or titled, the nature of each learning task is deduced easily from the pictures.

String-pulling and a monkey's use of tools are delineated in two films by Warden and Gilbert (240) and Warden (239). The first picture illustrates tool-using on single and multiple platforms, while the second film demonstrates the use of rakes for reaching food. It is shown that the monkey employs a short rake to get another one long enough to pull in the food. This procedure is continued until eight rakes in series are used by the animal.

The film by Weinstein (242) shows two rhesus monkeys sorting out red and blue stimulus objects in response to a symbol for red and a symbol for blue, respectively. A diverse assortment of stimulus objects is used involving eight variables: pattern, size, brightness, saturation, number, dimension, background, and configuration. The pictures and the accompanying sound commentary fully describe the training sequence. The responses of the animals have an important bearing upon the operational distinction between a sign and a symbol. The related film by Harlow (117) depicts the reactions of monkeys to stimuli having multiple sign values.

The film by Elder (88) demonstrates that a chimpanzee may consistently fail to open husked coconuts without tools. After watching another chimpanzee break the nut by pounding it on the floor, however, the first animal may then solve the problem immediately.

The use of mirror, slot, and punchboard mazes in studying the learning of children is illustrated in the film by Jones (139). A rat's progress in mastering a "U" maze is exhibited in a demonstrational

film by Freeman (94). Warden and Gilbert (240) show a white rat learning both elevated and Warner-Warden mazes.

The songs of canaries reared in isolation and stimulated with tones of different vibratos are recorded on a sound film by Metfessel (200). This picture also exhibits a bird that whistles a popular tune.

Short films dealing with selected aspects of the learning process have been made by Ellis (89), French (96), Hudson (127), Tolman (229), Tolman and Crannell (230), and Young (251).

PERCEPTION

(a) *Visual*

Two films on visual perception have been prepared by Gilbert (105, 104) for instruction in elementary psychology. The topics covered in the first picture are the phi phenomenon, optical illusions, brightness constancy, eye-movements in reading, and perception span. A series of numbers at the end of the film serve as material for determining the digit span. The second picture is photographed in natural color and covers the simple demonstrations of color mixture, retinal perimeter, color-blindness, and after-images, the last being illustrated with charts and diagrams. A Harvard film (57) reveals through high-speed motion pictures action which normally is beyond the limits of human perception. Interesting examples include the synchronism of muscle groups and the wings of a hummingbird in flight.

The color perception of bees is demonstrated in a color film by Ilse (134). After the bees have been fed on blue squares of paper they are able to discriminate the blue from gray, red, yellow, and green, but are confused by violet and purple. The experimental procedure is nicely shown in the film, but the color rendition is mediocre and uneven.

(b) *Auditory*

Dallenbach (83) has photographed the performance of blind and blindfolded sighted subjects in seven series of experiments on the perception of obstacles at a distance. By carefully varying the situation it is shown that the perceptual cues are basically aural.

(c) *Reading*

The recording and controlling of eye-movements in reading is exhibited in a film by Holland (126). Hamilton (116) presents some

suggestions for reading proficiency along with eight simple exercises for increasing reading speed. The best series of training films for reading have been produced by Dearborn and Anderson (84). More than 25 phrase-reading exercises have been prepared in which the phrases are presented successively across the screen. The perceptual span, the direction of eye-movements, and the speed of presentation are thus controlled. This technique appears to present numerous possibilities for the resourceful teacher and clinician.

Some relationships among reading, writing, and handedness are exhibited in a picture by Link, Hossack, and Beck (165). The first part of the film attempts to show by selected examples that mirror-writing with the left hand is comparable to normal script with the right hand. The point is made that mirror-script probably has its origin in the spontaneous scribbles of early childhood. Later sections of the picture exhibit free mirror-script in an alcoholic and a hypnotic subject. The film closes with examples of ancient and modern scripts that are written from left to right, right to left, and up and down. This picture, which was produced entirely by students, contains imperfections in both content and composition.

TESTS, GUIDANCE, AND EDUCATIONAL PROBLEMS

Tests and Test Performance

The administration of the short form of the New Stanford-Binet Scale is demonstrated with a 13-year-old boy in the talking film by Freeman (95). The reactions of the youngster are such as to suggest that pretest coaching had occurred, perhaps to facilitate the recording of the sound picture. A silent film by Gilbert and Garrett (106) shows the administration of Form L to a 5-year-old child. Only the tests passed are shown, starting from 4 years and running up to the 7-year level. "Close-ups" in parts of the film help to reveal the nature of the test materials. Titles explain the scoring standards and the calculation of the IQ.

The use of standard performance tests in examining both normal and feeble-minded children is demonstrated in a silent film distributed by the University of Minnesota (50). A picture by Werner (243) shows a new marble board test for analyzing visuo-motor performance. The film by Goldstein and Scheerer (108) shows the use of the Kohs models for detecting impairment of abstract behavior in patients suffering from disturbance of cortical

function. Modifications of the original test are demonstrated which render abstraction from size or figure unnecessary.

A film by Bayley (70) is designed for use with students of child development in order to familiarize them with the methods used in securing anthropometric measurements on young children. The procedures of taking 14 different measurements are shown, identified by captions. In addition there are illustrations of children with different body-builds, a chart showing curves for two children who grew at different rates, and a pictorial sequence of one child showing changes from 2 to 10 years of age. The film, *When Bobby Goes to School* (64), gives an elementary account of the various tests that constitute a physical examination. For no good reason, this film may be borrowed only with the approval of the local county medical society.

Vocational Guidance

An overview of occupations and aptitudes, arranged primarily for high school students, is provided in a well-edited, talking, Coronet film (244). Six aptitudes, clerical, mechanical, musical, artistic, social, and scholastic, are discussed and illustrated briefly. The testing sequences in the film are sketchy, and the tests are not identified. This film will serve best as an introduction to the field. The film by Ford (93) demonstrates the use of seven tests of motor aptitude with college subjects possessing mediocre and exceptional abilities. Some comparisons in assembly work also are made.

An ambitious film-production program is being carried on by Vocational Guidance Films, Inc. The complete four-year schedule calls for 64 reels of talking film, 61 of which are to be devoted to the presentation of factual information about fields of employment. The three other reels will contain advice on how to find and hold a job. Already available is the initial reel, *Finding Your Life Work* (232), and four pictures dealing with the fields of journalism (233), radio and television (234), automotive service (231), and wood-working (235). In the first film the candidate for a job is advised to appraise his intelligence, special aptitudes, educational record, interests, accomplishments, and social and economic assets. He is urged to get a broad view of many occupations, to make full use of the vocational departments in high school, and not to believe those people who say that there are no longer any vocational opportunities. The occupational films to be released in the near future deal with the fields of general farming, forestry, drafting,

retail selling, engineering, nursing, and accountancy. The continuity, organization, and sound-recording of the films are excellent.

The purpose and accomplishments of the NYA program are reviewed in the film, *Jobs, Not Handouts* (39). The work of the General College of the University of Minnesota in vocational orientation is outlined in the picture, *Is There Room for Us?* (38). *I Want a Job* (36) is an excellent training film for young job seekers. A number of interviews are presented in the talking picture, and one can see in a concrete way why certain applicants are not hired.

Educational Theory and Practice

The documentary films, *And So They Live* (90) and *The Children Must Learn* (238), bring into sharp relief the hiatus between education and the needs of the people in two rural communities typical of many throughout the United States. Pictures and commentary describe families living on land that is poor, their children suffering from lack of proper diet and adequate clothing. Resources immediately available for better living remain untapped because the people have never been taught how to use them. Meanwhile, in the schools the young people read from Chaucer, are taught about the lives of children in foreign lands, and learn from their readers how to save money and make good investments. The difference between the two films is chiefly one of emphasis. *And So They Live* is the longer film and gives a fuller documentation of the problems of the community and family life. *The Children Must Learn* contains a direct appeal to bring the school program into line with community programs. The film is distinguished by its use of folk music as a running accompaniment.

The progress of Negro education in the South from rural one-room schools to modern universities is graphically shown in the documentary film, *One-tenth of a Nation* (110). The film contains a plea for further extension of educational facilities for the Negro.

Progressive education in practice is surveyed in a number of films (17, 45, 86, 111, 237). Progressive educational theories are shown being tested in *Life's* summer camps (43). An attempt is made to relate all activities to the needs of the child. In an interview at the end of the picture, John Dewey expresses his approval of the project.

The American Friends Service Committee has produced a film (69) which illustrates the system of work camps established

to give college students and young business and professional people a chance to work in areas throughout the United States. From their contacts they can get firsthand knowledge of America's economic problems.

The plan of English and Scottish public education is well portrayed in a triad of talking films (10, 11, 12). The emphasis placed upon the value of the public nursery school is a healthy contrast to traditional American practice.

The preschool program, as it is carried on in the Iowa Child Welfare Research Station, is depicted fully in *Preschool Adventures* (223). Sympathetic understanding, extensive opportunities for constructive play, and rapid socialization are points which are stressed particularly in the picture.

ABNORMAL BEHAVIOR

Hypnosis and Aphasia

A film with far-reaching implications is *Hypnotic Induction of Color Vision Anomalies*, by Harriman (119). By appropriate post-hypnotic suggestions in a deep trance state the subject is rendered color-blind in the subsequent waking state for green and then red. The reactions on the Ishihara and Holmgren tests are consistent with the suggestions. This picture is well suited for instruction in elementary psychology and will help to convince skeptics of the genuineness of hypnotic phenomena. At the same time, however, the instructor may find himself taxed in offering an explanation of the phenomena which will satisfy the students. A second film by Harriman (118) depicts a subject in a deep trance who engages in cryptic automatic writing. Upon awakening he is unable to decipher the script. The assumption is that he was a second personality during the interval while he wrote and that he becomes a third personality in the period of posthypnotic somnambulism. By means of a conditioned-response technique, the normal personality is restored, whereupon the writing is deciphered.

An interesting case of nominal aphasia is presented in the talking film by Leighton and Lidz (154). The aphasia appeared simultaneously with a slight hemiplegia, but remained after the latter had disappeared. The difficulty that the subject experiences in selecting words is clearly apparent.

Experimental Neurosis

The technique of producing experimental neuroticism in the

rat is shown, step by step, in the well-known film by Maier and Glaser (184). In a later picture, Maier (182) develops the thesis that neurotic behavior is one of the many possible solutions to a difficult conflict situation. He shows that if the rat is allowed to substitute certain "escape" reactions, such as climbing on top of the starting box, jumping to the near wall, or clinging to the edge of the apparatus, the neurotic pattern is held in abeyance. When these "abortive" reactions are prevented, the neurotic attack appears with its stereotyped running, jumping, convulsions, and muscular passivity. Additional films dealing with aberrant behavior in rats have been made by Cook (82), Fields (91), and Maier and Sacks (185).

Difficult differentiation of signals for food produces chronic nervous disturbances in some dogs. The film by Gantt and Leighton (97) shows the reactions of one animal in which the anxiety-like state had persisted for seven years. Shift of the animal from laboratory to country abolished most of the symptoms, but they reappeared when the dog was returned.

A series of four films by Masserman (195, 196, 197, 198) outlines the induction and elicitation of experimental neuroses in cats. Conditioned feeding reactions are disrupted by a blast of air across the food box as the animal begins to eat. A few repetitions of this situation provoke the neurosis in which the cat, among other things, trembles or hides, refuses food, and shows marked startle to slight stimuli. Direct stimulation of the hypothalamus fails to produce reactions in any way like the conditioned emotional or neurotic symptoms. Furthermore, the simultaneous presentation of a conditioning signal with the sham rage pattern evoked by direct stimulation of the hypothalamus does not result in a "learning" of the sham pattern, even after hundreds of trials.

*Psychoses and Allied States**

The marked irregular movements of the face and extremities in Huntington's chorea are delineated in the film by Rossman (210). The film by Page (207) reviews the common symptoms of schizophrenia as they are exhibited by patients in the average public asylum. Although the facial expression in most subjects is concealed by a mask, the picture shows such reactions as automatism, negativism, waxy flexibility, silliness, and volubility re-

* Several psychiatric films have been omitted from this section because no arrangements have been made for their distribution to nonmedical groups.

leased by delusions and hallucinations. This picture is essentially a cinematic chronicle and makes no attempt to explain the psychological significance of the patient's symptoms. The companion picture (208), which deals with the treatment of mental disorders, shows what a lay visitor to a psychopathic hospital might see of hydrotherapy, fever treatment, and the use of insulin, metrazol, and divers sedatives. The final scenes of recreational activities in a psychiatric hospital are somewhat depressing. One member of a preview panel remarked after seeing this film: "No wonder the remission rate is low!"

The Johns Hopkins series of psychiatric films aims to portray in detail the reactions of each psychotic patient. Two silent films (150, 149) are devoted to the contrasting motility exhibited in schizophrenia. In the first case the pattern is one of stuporous catatonia, while in the second the actions are stereotyped and ritualistic. A pair of talking films (151, 152) vividly demonstrate delusions and hallucinations in senility and delusions arising from a head injury. A rare type of syncope is exhibited in the film by Leighton and Rosen (155).

Recent modifications of convulsive shock therapy in which the paroxysms are softened with curare and quinine methochloride are clearly revealed in the color film by Bennett and Cash (74). Bennett (71) also shows recent progress in the use of convulsive therapy with affective psychotic states. In another film Bennett (72) illustrates the duties of a nurse in a modern psychiatric hospital.

Feeble-mindedness

One of the finest 16-millimeter films ever made deals with the care of the feeble-minded. This picture, which was photographed at Woodbine Colony by Bugbee (78), presents the historical changes in attitude toward the feeble-minded and briefly sketches the early efforts of Pinel and Esquirol. The main portion of the film gives a subtle portrayal of the inmate's position in a modern feeble-minded colony. The continuity and color in this film are outstanding. Three other films on the feeble-minded have been prepared by the Visual Education Service, University of Minnesota. The first film (37) portrays the daily activities and training program in the school for the feeble-minded at Faribault. The second picture (24) treats the subject of the feeble-minded from the standpoint of pathology. The introduction mentions briefly the possible organic conditions causing feeble-mindedness. A half-reel sequence

on performance testing serves to differentiate the morons, imbeciles, and idiots. The main body of the film is concerned with describing the eight major pathological groups: hypertelorism, oxycephalus, microcephaly, hydrocephalus, cretinism, mongolism, epilepsy, and cerebral palsy. The third film (50) deals with performance testing and compares the reactions of feeble-minded and normal youngsters on the manikin, Seguin formboard, Knox cube, diamond, and memory tests.

Strauss and Werner (226) demonstrate deficiencies in counting and localizing the fingers by some feeble-minded boys. Mitrano (201) attempts to show that an aphasic child, compared with a feeble-minded youngster, shows more discrepancies between verbal and manipulative tests, on the one hand, and the language development and social competence, on the other. The film by Allen (1) traces the mental development of a young man who had been isolated for 16 years by epileptic seizures.

Educational opportunities for retarded and handicapped children are reviewed in a pair of silent films (4, 65).

Training of the Blind and Deaf

Five films show special techniques for teaching blind children how to read and write (6, 54, 55), mental-hygiene work with the blind (22), and the way the blind are taught to avail themselves of the help of dogs (250). The last picture is an unusual document in showing both the training of the "Seeing Eye" dogs and the gradual acquisition of confidence in the dogs by their blind companions.

The education of deaf children and adults is described in two films (8, 26) which were produced by schools for the deaf.

Delinquency and Crime

The catalog of Teaching Film Custodians (274) lists more than 20 fictional excerpts that are edited to show the folly of crime. The efforts of the Federal Bureau of Investigation in tracking down criminals are presented graphically in a film entitled *You Can't Get Away With It* (68). Rehabilitative work in a federal prison is well portrayed in a March of Time film (14). The handling of juvenile delinquency is portrayed in four pictures (3, 5, 29, 59).

Borderline Phenomena

A photographic study of Negro religious ecstasy with accom-

panying sound-recording has been made by Brandt, Belo, and Mead (76). The picture shows the behavior of the congregation and its leaders and reviews various phases of the sanctified church service.

A comparison of the superstitions of colonial days and those that are believed today reveals a close similarity, as shown in excerpts from the feature picture, *Maid of Salem* (138). Another film (66) portrays the pervasiveness of superstition among primitive peoples.

The premonitions and predictions of Nostrodamus, born in 1503, are reviewed in a film (46) by the same name. The escape from death, possibly by mental telepathy, is presented in the picture, *What Do You Think?* (63). Handwriting and what it means to the graphologist is outlined in the film on *Personality and the Pen* (51).

DOCUMENTARY FILMS

A large number of documentary films are being produced currently. These pictures are fact films with a social story to tell. Some noteworthy examples include *The River* (166), *The Spanish Earth* (135), *The Four Hundred Million* (136), *United Action* (187), *Youth of a Nation* (144), *Valley Town* (236), and *Machine: Master or Slave* (206). Undoubtedly, the present international crisis will stimulate the production of documentary pictures on propaganda and war. For a survey of war films which are currently available for classroom use, the reader should consult the catalogs, *Living Films* (254), *March of Time* (256), *Films on War and American Policy* (252), and *Films of Distinction* (266). For a detailed portrayal of war at its worst, *The World in Flames* (67) is a film that has no equal. The facial expression of Mussolini as he addresses a Fascist gathering and the scenes of a French mob breaking and hurling bricks are outstanding photographic "scoops."

A SUGGESTED GROUP OF FILMS FOR COURSES IN GENERAL PSYCHOLOGY

1. Development of Behavior (30, 129, 132, 224).
2. Animal and Infant Behavior (70, 147, 148, 177, 178).
3. Response Mechanism (13, 15, 33, 34, 73, 214).
4. Learning (109, 195, 213, 216, 217, 239, 242).
5. Perception (104, 105).

6. Tests, Guidance, and Educational Problems (36, 93, 106, 223, 238, 244).
7. Abnormal Behavior (74, 78, 97, 119, 149, 151, 184, 196).
8. Social Behavior (67, 160, 202, 203).

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15. ANON. Curves of color. Schenectady: General Electric Co., Visual Instruction Section, 1941. 400 ft., sound, color, free loan.

⁵ Many films may be obtained from state departments of visual instruction as well as from the national libraries listed in the bibliography.

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18. ANON. Evolution of the motion picture. New York: Bell & Howell, 30 Rockefeller Plaza, 1940. 1000 ft., sound, monochrome, \$72 sale, \$3.00 rental.
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84. DEARBORN, W. F., & ANDERSON, I. H. The Harvard films for the improvement of reading. Cambridge: Harvard Film Service, 1938. 15 films, 200 ft. each, silent, monochrome, \$110 sale. (DEARBORN, W. F., & ANDERSON, I. H. A new method for teaching phrasing and for increasing the size of reading fixations. *Psychol. Rec.*, 1937, 1, 459-475; Controlled reading by means of a motion picture technique. *Psychol. Rec.*, 1938, 2, 219-227; A sound motion-picture technique for teaching beginning reading. *Sch. & Soc.*, 1940, 52, 367-369.)
85. DELEE, J. B. Injuries of the newborn. Chicago: J. B. DeLee Films, 5028 Ellis Ave., 1936. 400 ft., sound, monochrome, \$40 sale, \$2.50 rental.
86. DICK, L. School. New York: American Film Center, 45 Rockefeller Plaza, 1939. 700 ft., sound, monochrome, rental and sale prices on request.
87. DURDEN, F. V., & SMITH, P. F. Development of the trout. New York: Visual Library, 1600 Broadway, 1938. 700 ft., silent, monochrome, rental and sale prices on request.
88. ELDER, J. H. Imitation and the effect of dominance status on learning in chimpanzees. Madison: Department of Psychology, Univ. Wisconsin, 1938. 400 ft., silent, monochrome, rental and sale prices on request.
89. ELLIS, W. D. Instruction in animal psychology. Tucson: Department of Psychology, Univ. Arizona, 1939. 300 ft., silent, monochrome, \$25 sale. (HAMILTON, J. A., & ELLIS, W. D. Persistence and behavior constancy. *J. genet. Psychol.*, 1933, 42, 140-153.)
90. FERNO, J., & ROFFMAN, J. And so they live. New York: New York Univ. Film Library, 71 Washington Square, 1940. 850 ft., sound, monochrome, \$4.00 rental.
91. FIELDS, P. E. A quantitative investigation of bodily changes induced in aberrant and normal rats by varying the difficulty of visual size discriminations. Delaware: Department of Psychology, Ohio Wesleyan Univ., 1940. 350 ft., silent, monochrome, rental and sale prices on request.
92. FLETCHER, H. Life begins again. New York: Western Electric Co., 195 Broadway, 1940. 800 ft., sound, monochrome, free loan.
93. FORD, A. Motor aptitude tests and assembly work. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1941. 500 ft., silent, monochrome, \$25 sale.
94. FREEMAN, G. L. Animal learning. Chicago: College Film Center, 59 E. Van Buren St., 1938. 350 ft., silent, monochrome, \$1.50 rental.
95. FREEMAN, G. L. Measurement of intelligence. Chicago: College Film Center, 59 E. Van Buren St., 1938. 550 ft., sound, monochrome, \$3.00 rental.

96. FRENCH, J. W. Maze learning in goldfish. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1941. 140 ft., silent, color, \$15 sale. (*Psychol. Bull.*, 1941, **38**, 614.)
97. GANTT, W. H., & LEIGHTON, A. H. Experimental "neurosis" in a dog. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 220 ft., silent, monochrome, \$11 sale.
98. GESELL, A. Clinical case studies: developmental deviations. Series A. New Haven: Yale Clinic of Child Development, 1940. 700 ft., silent, monochrome, sale price on request.
99. GESELL, A. Individuality in infancy. New Haven: Yale Clinic of Child Development, 1939. 400 ft., silent, monochrome, sale price on request. (GESELL, A., & AMES, L. B. Early evidences of individuality in the human infant. *Sci. Mon.*, N. Y., 1937, **45**, 217-225.)
100. GESELL, A. The patterning of prone behavior in the human infant. New Haven: Yale Clinic of Child Development, 1939. 400 ft., silent, monochrome, sale price on request. (AMES, L. B. The sequential patterning of prone progression in the human infant. *Genet. Psychol. Monogr.*, 1937, **19**, 409-460.)
101. GESELL, A. Series of 24 edited normative films: ball behavior, 40-56 wks., 100 ft.; bell behavior, 16-56 wks., 125 ft.; cup behavior, 12-36 wks., 75 ft.; cup and cubes, 32-56 wks., 90 ft.; cup and spoon, 40-56 wks., 200 ft.; consecutive cubes, 12-56 wks., 300 ft.; dangling ring, 4-28 wks., 175 ft.; form board, 20-56 wks., 225 ft.; massed cubes, 16-56 wks., 200 ft.; mirror, 40-56 wks., 75 ft.; paper and crayon, 36-56 wks., 80 ft.; pellet, 12-56 wks., 100 ft.; pellet in bottle and pellet beside bottle, 40-52 wks., 135 ft.; performance box, 40-52 wks., 110 ft.; prone, 4-56 wks., 110 ft.; rattle, 4-28 wks., 110 ft.; ring and string, 28-56 wks., 100 ft.; ring, string, and bell, 32-56 wks., 60 ft.; sitting, 4-52 wks., 225 ft.; spoon, 16-56 wks., 60 ft.; stairs, 40-56 wks., 40 ft.; standing, 4-60 wks., 225 ft.; supine, 4-40 wks., 65 ft.; tower building, 44-56 wks., 30 ft. New Haven: Yale Clinic of Child Development, 1939. All silent, monochrome, sale prices on request. (GESELL, A. Cinemanalysis: a method of behavior study. *J. genet. Psychol.*, 1935, **47**, 1, 3-16. GESELL, A., *et al.* An atlas of infant behavior. New Haven: Yale Univ. Press, 1934. Vol. I. GESELL, A., & THOMPSON, H. Infant behavior: its genesis and growth. New York: McGraw-Hill, 1934; Psychology of early growth, including norms of infant behavior. New York: Macmillan, 1938.)
102. GESELL, A. Technical reel showing procedures for developmental examinations. New Haven: Yale Clinic of Child Development, 1939. 400 ft., silent, monochrome, sale price on request. (GESELL, A., THOMPSON, H., & AMATRUDA, C. S. The psychology of early growth. New York: Macmillan, 1938.)
103. GESELL, A. The tonic neck reflex in the human infant. New Haven: Yale Clinic of Child Development, 1939. 125 ft., silent, monochrome, sale price on request.
104. GILBERT, G. M. Color vision. New York: Warden & Gilbert Films, Columbia Univ., 1938. 200 ft., silent, color, \$30 sale. (*Psychol. Abstr.*, 1939, **13**, #1248.)
105. GILBERT, G. M. The experimental psychology of vision. New York: Warden & Gilbert Films, Columbia Univ., 1938. 380 ft., silent, monochrome, \$23 sale. (*Psychol. Abstr.*, 1939, **13**, #1247.)

106. GILBERT, G. M., & GARRETT, H. E. Testing the IQ. New York: Warden & Gilbert Films, Columbia Univ., 1940. 375 ft., silent, \$23 sale. (*Psychol. Abstr.*, 1940, 14, #6245.)
107. GIRDEN, E. The dissociative effects of curare. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 280 ft., silent, monochrome, \$14 sale.
108. GOLDSTEIN, K., & SCHEERER, M. Impairment of abstract behavior manifested in a test performance. Medford, Mass.: Tufts College, 1940. 400 ft., silent, color, \$50 sale, \$10 rental. (BOLLES, M., & GOLDSTEIN, K. A study of the impairment of "abstract behavior" in schizophrenic patients. *Psychiat. Quart.*, 1938, 12, 42-65).
109. GORDON, K. Learning in golden-mantled ground squirrels. Corvallis: Department of Zoology, Oregon State Agricultural College, 1936-1938. 800 ft., silent, monochrome, sale price on request.
110. GREENE, F. One-tenth of a nation. New York: American Film Center, 45 Rockefeller Plaza, 1940. 1000 ft., sound, monochrome, rental and sale prices on request.
111. HADLEY, A. M. Glimpses of education in western Massachusetts. Geneva, N. Y.: Allan M. Hadley, Hobart College, 1937. 600 ft., sound, monochrome, sale price on request.
112. HALSTEAD, W. C. Objective methods for the analysis of human brain cases. 1. A case of parietal lobectomy. Chicago: Univ. Chicago, 1937. 400 ft., silent, monochrome, \$5.00 rental.
113. HALSTEAD, W. C. Objective methods for the analysis of human brain cases. 2. Charting the visual fields with direct control of ocular fixation. Chicago: Univ. Chicago, 1938. 400 ft., silent, monochrome, \$5.00 rental. (HALSTEAD, W. C. A method for the quantitative recording of eye movements. *J. Psychol.*, 1938, 6, 177-180.)
114. HALSTEAD, W. C. Objective methods for the analysis of human brain cases. 3. Social behavior following cerebral lobectomy. Chicago: Univ. Chicago, 1938. 400 ft., silent, monochrome, \$5.00 rental.
115. HALSTEAD, W. C. Objective methods for the analysis of human brain cases. 4. Response equivalence in a case of spastic quadriplegia. Chicago: Univ. Chicago, 1938. 250 ft., silent, monochrome, \$5.00 rental.
116. HAMILTON, J. California reading film. Berkeley: Department of Visual Instruction, Univ. California, 1939. 700 ft., silent, monochrome, \$28 sale, \$1.50 rental.
117. HARLOW, H. F. Responses by monkeys to stimuli having multiple sign values. Madison: Department of Psychology, Univ. Wisconsin, 1941. 550 ft., silent, color, sale price on request, \$3.00 rental.
118. HARRIMAN, P. L. Cryptic automatic writing by a multiple personality. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1941. 310 ft., silent, monochrome, \$15.50 sale.
119. HARRIMAN, P. L. Hypnotic induction of color vision anomalies. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 465 ft., silent, color, \$69 sale. (ERICKSON, M. H. The induction of color blindness by a technique of hypnotic suggestion. *J. genet. Psychol.*, 1939, 20, 61-89. GREYER, W. F. A comment on "the induction of color blindness by a technique of hypnotic suggestion." *J. genet. Psychol.*, 1940, 23, 207-210.)
120. HEWER, R. R., DURDEN, J. V., & SMITH, P. F. Development of the tadpole.

- New York: Visual Library, 1600 Broadway, 1937. 548 ft., sound, monochrome, sale price on request.
121. HILL, D. B. Before the baby comes. Chicago: Bell & Howell, 1801 Larchmont Ave., 1939. 400 ft., sound, monochrome, \$36 sale, \$1.50 rental.
 122. HILL, D. B. The child grows up. Chicago: Bell & Howell, 1801 Larchmont Ave., 1940. 400 ft., sound, monochrome, \$36 sale, \$1.50 rental.
 123. HILL, D. B. The first year. Chicago: Bell & Howell, 1801 Larchmont Ave., 1940. 400 ft., sound, monochrome, \$36 sale, \$1.50 rental.
 124. HILL, D. B. Life of a healthy child. Chicago: Bell & Howell, 1801 Larchmont Ave., 1939. 400 ft., sound, monochrome, \$36 sale, \$1.50 rental.
 125. HILL, D. B. Road to health and happiness. Chicago: Bell & Howell, 1801 Larchmont Ave., 1939. 400 ft., sound, monochrome, \$36 sale, \$1.50 rental.
 126. HOLLAND, B. F. Recording and controlling eye movements in reading. Austin: B. F. Holland, Univ. Texas, 1939. 1000 ft., silent, monochrome, \$70 sale, \$3.00 rental.
 127. HUDSON, B. B. One trial learning in rats. Berkeley: Department of Psychology, Univ. California, 1939. 200 ft., silent, monochrome, sale price on request.
 128. HULIN, W. S., & MOORE, A. R. Coordination in starfish. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938. 360 ft., silent, monochrome, \$18 sale. (MOORE, A. R. Injury, recovery and function in an aganglionic central nervous system. *J. comp. Psychol.*, 1939, 28, 313-333.)
 129. HUXLEY, J. S., & HEWER, H. R. Heredity in animals. New York: Visual Library, 1600 Broadway, 1937. 700 ft., sound, monochrome, sale price on request. (*Psychol. Abstr.*, 1938, 12, #5858.)
 130. HUXLEY, J. S., & HEWER, H. R. Heredity in man. New York: Visual Library, 1600 Broadway, 1937. 518 ft., sound, monochrome, sale price on request. (*Psychol. Abstr.*, 1938, 12, #5859.)
 131. HUXLEY, J. S., & HEWER, H. R. Paramecium. New York: Visual Library, 1600 Broadway, 1937. 800 ft., sound, monochrome, sale price on request.
 132. HUXLEY, J. S., HEWER, H. R., & DURDEN, J. V. Development of the chick. New York: Visual Library, 1600 Broadway, 1937. 800 ft., sound, monochrome, sale price on request.
 133. HUXLEY, J. S., HEWER, H. R., & DURDEN, J. V. From generation to generation. New York: Visual Library, 1600 Broadway, 1937. 810 ft., sound, monochrome, sale price on request.
 134. ILSE, D. Experiments on the colour sense of insects. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938. 220 ft., silent, color, \$30 sale.
 135. IVENS, J. The Spanish earth. New York: Brandon Films, 1600 Broadway, 1937. 2000 ft., sound, monochrome, rental price on request.
 136. IVENS, J., & FERNO, J. The four hundred million. New York: Brandon Films, 1600 Broadway, 1938-1939. 2000 ft., sound, monochrome, rental price on request.
 137. JAMES, W. T. Experiments on behavior and its relation to physical form. Ithaca: Cornell Univ., 1941. 400 ft., silent, monochrome, sale price on request.
 138. JESTER, R. Have times changed? New York: Films, Inc., 300 W. 42nd St., 1938. 400 ft., sound, monochrome, \$1.50 rental.

139. JONES, H. E. Experimental studies of the learning process in children: II. Berkeley: Institute of Child Welfare, Univ. California, 1939. 400 ft., silent, monochrome, \$30 sale. (JONES, H. E., & YOSHIOKA, J. G. Differential errors in children's learning on a stylus maze. *J. comp. Psychol.*, 1938, **25**, 463-480. BUEL, J. A stylus punchboard maze with automatic differential and cumulative response indicators. *J. genet. Psychol.*, 1939, **55**, 221-228.)
140. KAUFMAN, N. The ant city. New York: UFA Films, Inc., 729 7th Ave., 1937. 518 ft., sound, monochrome, \$50 sale, \$3.50 rental. (*Psychol. Abstr.*, 1939, **13**, #5633.)
141. KAUFMAN, N. Life of the bee. New York: UFA Films, Inc., 729 7th Ave., 1938. 600 ft., sound, monochrome, \$50 sale, \$3.50 rental.
142. KAUFMAN, N. Plant power. New York: UFA Films, Inc., 729 7th Ave., 1937. 473 ft., sound, monochrome, \$50 sale, \$3.50 rental.
143. KAUFMAN, N. Sensitivity of plants. New York: UFA Films, Inc., 729 7th Ave., 1938. 518 ft., sound, monochrome, \$50 sale, \$3.50 rental. (*Psychol. Abstr.*, 1939, **13**, #5635.)
144. KISSACK, R., & MOSKOVITZ, N. Youth of a nation. Washington: National Youth Administration, 2145 C St., 1939. 700 ft., sound, monochrome, rental price on request.
145. LAIRD, D. How we get to be human. Hamilton, N. Y.: Colgate Univ., 1937. 1200 ft., silent, monochrome, price on request. (*Psychol. Abstr.*, 1938, **12**, #1699.)
146. LEGG, S. Mites and monsters. New York: W. O. Gutlohn, 35 W. 45th St., 1938. 600 ft., sound, monochrome, \$72 sale, \$3.00 rental.
147. LEGG, S. Monkey into man. New York: W. O. Gutlohn, 35 W. 45th St., 1938. 504 ft., sound, monochrome, \$72 sale, \$3.00 rental.
148. LEGG, S., & SPICE, E. Fingers and thumbs. New York: W. O. Gutlohn, 35 W. 45th St., 1938. 650 ft., sound, monochrome, \$4.00 rental.
149. LEIGHTON, A. H. Athetoid gestures in a deteriorating parergasic (schizophrenic). Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 180 ft., silent, monochrome, \$9.00 sale.
150. LEIGHTON, A. H. Catatonic behavior in a deteriorated parergasic (schizophrenic) patient. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938. 170 ft., silent, monochrome, \$8.50 sale.
151. LEIGHTON, A. H. Delusions and hallucinations in a senile setting. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 175 ft., sound, monochrome, \$14 sale.
152. LEIGHTON, A. H. Paranoid state and deterioration following head injury. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 382 ft., sound, monochrome, \$30.50 sale.
153. LEIGHTON, A. H. A parergasic reaction (schizophrenia) in a person of low intelligence. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 550 ft., sound, monochrome, \$44 sale.
154. LEIGHTON, A. H., & LIDZ, T. A case of aphasia. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 513 ft., sound, monochrome, \$41 sale.
155. LEIGHTON, A. H., & ROSEN, V. H. Carotid sinus syndrome. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 360 ft., silent, monochrome, \$18 sale.
156. LEWIN, K. The child and the field forces. Iowa City: Department of Visual

- Education, State Univ. Iowa, 1929. 415 ft., silent, monochrome, \$23 sale.
157. LEWIN, K. Field forces as an impediment to a performance. Iowa City: Department of Visual Education, State Univ. Iowa, 1929. 392 ft., silent, monochrome, \$22 sale.
 158. LEWIN, K. Walking upstairs for the first time. Iowa City: Department of Visual Education, State Univ. Iowa, 1929. 151 ft., silent, monochrome, \$9.00 sale.
 159. LEWIN, K., & LEONARD, M. Level of aspiration in young children. Iowa City: Department of Visual Education, State Univ. Iowa, 1929. 412 ft., silent, monochrome, \$25 sale.
 160. LEWIN, K., LIPPITT, R., & WHITE, R. Experimental studies in social climates of groups. Iowa City: Department of Visual Education, State Univ. Iowa, 1939. 1200 ft., sound, monochrome, \$95 sale, \$7.00 rental from College Film Center. (BARKER, R., DEMBO, T., & LEWIN, K. Frustration and regression: an experiment with young children. *Univ. Ia Stud. Child Welf.*, 1941, 18, xv-314. LEWIN K., LIPPITT, R., & WHITE, R. Patterns of aggressive behavior in experimentally created "social climates." *J. soc. Psychol.*, 1939, 10, 271, 299. LIPPITT, R. An experimental study of authoritarian and democratic group atmospheres. *Univ. Ia Stud. Child Welf.*, 1940, 16, 43-195.)
 161. LEWIS, W. H., & GREGORY, P. W. Short film on early development of the rabbit egg. Baltimore: Department of Embryology, Carnegie Institution, 1938. 200 ft., silent, monochrome, \$1.50 rental.
 162. LEWIS, W. H., & GREGORY, P. W. Long film on the early development of the rabbit egg in vitro. Baltimore: Department of Embryology, Carnegie Institution, 1938. 1000 ft., silent, monochrome, \$4.00 rental.
 163. LEWIS, W. H., & HARTMAN, C. G. Early divisions (2-8 cells) of the living monkey egg in vitro. Baltimore: Department of Embryology, Carnegie Institution, 1938. 200 ft., silent, monochrome, \$1.50 rental.
 164. LINDSLEY, D. B., & SASSAMAN, W. H. "Voluntary" control of hair raising with associated autonomic phenomena. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 180 ft., silent, monochrome, \$9.00 sale. (LINDSLEY, D. B., & SASSAMAN, W. H. Autonomic activity and brain potentials associated with "voluntary" control of the pilomoters. *J. Neurophysiol.*, 1938, 1, 342-349.)
 165. LINK, G., HOSSACK, B., & BECK, L. F. Mirror writing. Eugene: Department of Psychology, Univ. Oregon, 1940. 275 ft., silent, monochrome, rental and sale prices on request.
 166. LORENTZ, P. The river. Washington: U. S. Office of Government Reports, 1937. 1200 ft., sound, monochrome, free loan.
 167. LYMAN, R. Tests of vestibular function. Rochester: Eastman Classroom Films, 1936. 400 ft., silent, monochrome, \$24 sale.
 168. MCGRAW, M. B. Crawling and creeping: I & II. New York: Warden & Gilbert Films, Columbia Univ., 1939. I, 300 ft., silent, monochrome, \$18 sale; II, 200 ft., silent, monochrome, \$12 sale. (*J. genet. Psychol.*, 1941, 58, 83-111.)
 169. MCGRAW, M. B. Development of the plantar response in the human infant. New York: Warden & Gilbert Films, Columbia Univ., 1939. 180 ft., silent, monochrome, \$12 sale.

170. MCGRAW, M. B. The Moro reflex. New York: Warden & Gilbert Films, Columbia Univ., 1939. 275 ft., silent, monochrome, \$15 sale.
171. MCGRAW, M. B. Neural maturation as exemplified in the changing reaction of the infant to pin prick. New York: Warden & Gilbert Films, Columbia Univ., 1941. 300 ft., silent, monochrome, \$18 sale. (*Child Developm.*, 1941, 12, 31-42; *Psychol. Abstr.*, 1941, 15, #4072.)
172. MCGRAW, M. B. Neural maturation as exemplified in the reaching-prehensile behavior of the human infant. New York: Warden & Gilbert Films, Columbia Univ., 1941. 350 ft., silent, monochrome, \$21 sale. (*J. Psychol.*, 1941, 11, 127-141; *Psychol. Abstr.*, 1941, 15, #4071.)
173. MCGRAW, M. B. Neural maturation as reflected in the development of anti-gravity musculature (sitting posture). New York: Warden & Gilbert Films, Columbia Univ., 1940. 250 ft., silent, monochrome, \$15 sale. (*Psychol. Abstr.*, 1941, 15, #601.)
174. MCGRAW, M. B. Neuromuscular development as reflected in the assumption of an erect posture. New York: Warden & Gilbert Films, Columbia Univ., 1941. 175 ft., silent, monochrome, \$12 sale. (*Psychol. Abstr.*, 1941, 15, #1559.)
175. MCGRAW, M. B. Neuromuscular development of the infant as exemplified in the achievement of erect locomotion. New York: Warden & Gilbert Films, Columbia Univ., 1939. 250 ft., silent, monochrome, \$15 sale.
176. MCGRAW, M. B. Postural adjustments of the infant when held in an inverted position. New York: Warden & Gilbert Films, Columbia Univ., 1939. 175 ft., silent, monochrome, \$12 sale.
177. MCGRAW, M. B. Quantitative measures of developmental processes in erect locomotion. New York: Warden & Gilbert Films, Columbia Univ., 1939. 600 ft. (2 reels, 300 ft. each), silent, monochrome, \$35 sale or \$18 per reel. (*Psychol. Abstr.*, 1939, 13, #1137.)
178. MCGRAW, M. B. Reflex behavior of the newborn infant. New York: Warden & Gilbert Films, Columbia Univ., 1939. 160 ft., silent, monochrome, \$12 sale. (*Psychol. Abstr.*, 1941, 15, #4073.)
179. MCGRAW, M. B. Reflex swimming movements in the newborn of different species. New York: Warden & Gilbert Films, Columbia Univ., 1939. 100 ft., silent, monochrome, \$8.00 sale.
180. MCGRAW, M. B. Suspension grasp behavior of the human infant. New York: Warden & Gilbert Films, Columbia Univ., 1939. 225 ft., silent, monochrome, \$14 sale.
181. MCGRAW, M. B. Swimming behavior of the human infant. New York: Warden & Gilbert Films, Columbia Univ., 1939. 250 ft., silent, monochrome, \$15 sale.
182. MAIER, N. R. F. Abortive behavior as an alternative for the neurotic attack in the rat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 320 ft., silent, monochrome, \$16 sale. (*Psychol. Abstr.*, 1941, 15, #1783.)
183. MAIER, N. R. F. The intelligence of white rats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1933. 400 ft., silent, monochrome, \$20 sale.
184. MAIER, N. R. F., & GLASER, N. M. Experimentally produced neurotic behavior in the rat. Bethlehem, Pa.: Psychological Cinema Register, 1457

- Main St., 1938. 600 ft., silent, monochrome, \$30 sale. (*Psychol. Abstr.*, 1939, 13, #2001. MAIER, N. R. F. Studies of abnormal behavior of the rat. New York: Harper, 1939.)
185. MAIER, N. R. F., & SACKS, J. Metrazol induced convulsions in normal and "neurotic" rats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 360 ft., silent, monochrome, \$18 sale.
 186. MARCH OF TIME. Movies march on. New York: Museum of Modern Art Film Library, 11 W. 53rd St., 1940. 1000 ft., sound, monochrome, rental and sale prices on request.
 187. MARTINI, M. United action. New York: Brandon Films, 1600 Broadway, 1939. 1200 ft., sound, monochrome, rental price on request.
 188. MARVIN, D. Modern motherhood. Woodside, N. Y.: D. Marvin, 30-31 Hobart St., 1938. 400 ft., silent, monochrome, sale price on request.
 189. MASSERMAN, J. H. The effects of ethyl alcohol on the motor cortex and the hypothalamus of the cat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939-1940. 90 ft., silent, monochrome, \$4.50 sale.
 190. MASSERMAN, J. H. The effects of pentamethylenetetrazol (metrazol) on the functions of the hypothalamus in the cat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 100 ft., silent, monochrome, \$5.00 sale.
 191. MASSERMAN, J. H. The effects of picrotoxin on the functions of the hypothalamus of the cat. Chicago: Division of Psychiatry and the Otho S. A. Sprague Institute, Univ. Chicago, 1938. 300 ft., silent, color, sale price on request. (*Psychol. Abstr.*, 1939, 13, #1216. MASSERMAN, J. H. Effects of analeptic drugs on the hypothalamus of the cat. *Res. Publ. Ass. nerv. ment. Dis.*, 1940, 20, 624-634.)
 192. MASSERMAN, J. H. The functions of the hypothalamus in the cat: destruction experiments. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1937-1940. 290 ft., silent, monochrome, \$14.50 sale. (MASSERMAN, J. H. Destruction of the hypothalamus in cats. *Arch. Neurol. Psychiat.*, 1938, 39, 1250-1271.)
 193. MASSERMAN, J. H. The functions of the hypothalamus in the cat: the effect of electrical stimulation. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1937-1940. 250 ft., silent, monochrome, \$12.50 sale.
 194. MASSERMAN, J. H. The reaction of the heart to faradic stimulation of the hypothalamus. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 60 ft., silent, color, \$9.00 sale.
 195. MASSERMAN, J. H. The role of the hypothalamus in emotion and experimental neurosis. 1. Conditioned feeding behavior in the cat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938-1941. 200 ft., silent, monochrome, \$10 sale.
 196. MASSERMAN, J. H. The role of the hypothalamus in emotion and experimental neurosis. 2. The production of experimental neuroses in cats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938-1941. 450 ft., silent, monochrome, \$22.50 sale.
 197. MASSERMAN, J. H. The role of the hypothalamus in emotion and experimental neurosis. 3. The role of the hypothalamus in conditioned feeding behavior. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938-1941. 140 ft., silent, monochrome, \$7.00 sale.

- c 198. MASSERMAN, J. H. The role of the hypothalamus in emotion and experimental neurosis. 4. Direct hypothalamic conditioning. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 400 ft., silent, monochrome, \$20 sale.
199. MASSERMAN, J. H. The stimulant effects of dilute ethyl alcohol on the cruciate cortex of the cat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 120 ft., silent, monochrome, \$6.00 sale.
200. METFESSEL, M. Song-isolated roller canaries. Los Angeles: Department of Psychology, Univ. Southern California, 1939. 400 ft., sound, monochrome, sale price on request.
201. MITRANO, A. J. The differentiation of aphasia from mental deficiency in children. Yonkers, N. Y.: A. J. Mitrano, 15 Glenbrook Ave., Park Hill, 1938. 350 ft., silent, monochrome, \$40 sale.
202. MOWRER, O. H. Animal studies in the social modification of organically motivated behavior. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1937-1938. 260 ft., silent, monochrome, \$13 sale.
203. MOWRER, O. H. An experimentally produced "social problem" in rats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 250 ft., silent, monochrome, \$12 sale.
204. MOWRER, O. H., KORNEICH, J. S., & YOFFE, I. Competition and dominance in rats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 280 ft., silent, monochrome, \$14 sale.
205. NEFF, W. D., SMITH, K. U., & KAPPAUF, W. E. The technique of brain surgery on the cat with observations on vestibular disfunction after sectioning the eighth nerve. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 320 ft., silent, monochrome, \$16 sale.
206. NEIBUHR, W. Machine: master or slave. New York: New York Univ. Film Library, 1941. 600 ft., sound, monochrome, \$3.00 rental.
207. PAGE, J. D. Symptoms in schizophrenia. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938. 400 ft., silent, monochrome, \$20 sale. (*Psychol. Abstr.*, 1941, 15, #1796.)
208. PAGE, J. D. The treatment of mental disorders. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 400 ft., silent, monochrome, \$20 sale. (*Psychol. Abstr.*, 1941, 15, #1797.)
209. PAVLOV, I. V. The nervous system. New York: Brandon Films, 1600 Broadway, 1937. 4000 ft., silent, monochrome, \$280 sale, \$28 rental, or \$30 sale, \$2.00 rental for each of 14 reels.
210. ROSSMAN, M. Huntington's chorea. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 240 ft., silent, monochrome, \$12 sale.
211. SARNOFF, J. Dissection of the brain. Brooklyn: J. Sarnoff, 1406 Albemarle Rd., 1937. 250 ft., silent, monochrome, sale price on request.
212. SCHNEIRLA, T. C. The behavior pattern of Central American army ants. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 650 ft., silent, monochrome, \$30 sale. (*Psychol. Abstr.*, 1939, 13, #5647.)
213. SMITH, K. U. The acquisition of the token-reward habit in the cat. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1937. 400 ft., silent, \$20 sale. (SMITH, M. F. The development and the extinction of the token-reward habit in the cat. *J. gen. Psychol.*, 1939, 20, 475-486; *Psychol. Abstr.*, 1941, 15, #1663.)

214. SMITH, K. U. Behavior disturbances after bilateral removal of the frontal areas of the cortex in cats. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1938. 350 ft., silent, monochrome, \$17.50 sale.
215. SMITH, K. U., & CARMICHAEL, L. Post-operative disturbances of visually controlled behavior in the cat following complete bilateral removal of the visual cortex. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1935. 300 ft., silent, monochrome, \$16.50 sale. (SMITH, K. U. The post-operative effects of removal of the striate cortex upon certain unlearned visually controlled reactions in the cat. *J. genet. Psychol.*, 1937, **50**, 137-156; Visual discrimination in the cat: V. The post-operative effects of removal of the striate cortex upon intensity discrimination. *J. genet. Psychol.*, 1937, **51**, 329-369.)
216. SMITH, K. U., & KAPPAUF, W. An analysis of the forms of animal learning: 1 & 2. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 380 ft., silent, monochrome, \$19 sale.
217. SMITH, K. U., & KAPPAUF, W. An analysis of the forms of animal learning: 3 & 4. Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1940. 300 ft., silent, monochrome, \$15 sale.
218. SPACE, K. F. Common mistakes and how to correct them. New York: Harmon Foundation, 140 Nassau St., 1939. 400 ft., silent, monochrome, \$30 sale, \$2.00 rental.
219. SPACE, K. F. Exposure and exposure meters. New York: Harmon Foundation, 140 Nassau St., 1939. 400 ft., silent, monochrome, \$30 sale, \$2.00 rental.
220. SPACE, K. F. Film editing. New York: Harmon Foundation, 140 Nassau St., 1939. 400 ft., silent, monochrome, \$30 sale, \$2.00 rental.
221. SPACE, K. F. How to use filters. New York: Harmon Foundation, 140 Nassau St., 1940. 400 ft., silent, monochrome, \$30 sale, \$1.50 rental.
222. SPACE, K. F. How to use your camera. New York: Harmon Foundation, 140 Nassau St., 1939. 360 ft., silent, monochrome, \$30 sale, \$2.00 rental.
223. STODDARD, G. D. Preschool adventures. Iowa City: Department of Visual Instruction, State Univ. Iowa, 1941. 1500 ft., silent, color, \$125 sale; monochrome, \$75 sale, \$3.00 rental.
224. STRANDSKOV, H. H. Heredity. Long Island City, N. Y.: Erpi Classroom Films, 1939. 360 ft., sound, monochrome, \$40 sale. (*Psychol. Abstr.*, 1941, **15**, #1705.)
225. STRANDSKOV, H. H. Reproduction among mammals. Long Island City, N. Y.: Erpi Classroom Films, 1937. 400 ft., sound, monochrome, \$40 sale.
226. STRAUSS, A., & WERNER, H. Deficiency in finger schema (agnosia and acalculia). Bethlehem, Pa.: Psychological Cinema Register, 1457 Main St., 1939. 320 ft., silent, monochrome, \$16 sale.
227. THORNBURGH, A. The realm of the honey bee. Washington: U. S. Department of Agriculture, 1935. 1600 ft., silent, monochrome, sale price on request.
228. TOLLEFSON, D. C., & MCNEILLE, L. B. Around the clock with you and your baby. Los Angeles: D. G. Tollefson, 511 S. Bonnie Brae St., 1941. 400 ft., silent, monochrome, free loan.
229. TOLMAN, E. C. Vicarious trial and error (VTE). Berkeley: Department of

- Psychology, Univ. California, 1937. 100 ft., silent, monochrome, sale price on request.
230. TOLMAN, E. C., & CRANNELL, C. W. An animated cartoon of the schematic sowbug. Berkeley: Department of Psychology, Univ. California, 1938. 175 ft., silent, monochrome, free loan.
 231. TWOGOOD, A. P. Automobile service. Des Moines, Ia.: Vocational Guidance Films, 1940. 400 ft., sound, monochrome, sale price on request.
 232. TWOGOOD, A. P. Finding your life work. Des Moines, Ia.: Vocational Guidance Films, 1940. 400 ft., sound, monochrome, sale price on request.
 233. TWOGOOD, A. P. Journalism. Des Moines, Ia.: Vocational Guidance Films, 1939. 400 ft., sound, monochrome, sale price on request.
 234. TWOGOOD, A. P. Radio and television. Des Moines, Ia.: Vocational Guidance Films, 1939. 400 ft., sound, monochrome, sale price on request.
 235. TWOGOOD, A. P. The woodworker. Des Moines, Ia.: Vocational Guidance Films, 1940. 400 ft., sound, monochrome, sale price on request.
 236. VAN DYKE, W. Valley town. New York: New York Univ. Film Library, 71 Washington Square, 1941. 1000 ft., sound, monochrome, \$4.00 rental.
 237. VAN DYKE, W., & BARLOW, R. Design for education. New York: Sarah Lawrence College, 1939. 700 ft., silent, monochrome, rental price on request.
 238. VAN DYKE, W., & POLLARD, S. The children must learn. New York: New York Univ. Film Library, 71 Washington Square, 1940. 500 ft., sound, monochrome, \$3.00 rental.
 239. WARDEN, C. J. Problem solving in monkeys. New York: Warden & Gilbert Films, Columbia Univ., 1938. 420 ft., silent, monochrome, \$25 sale. (*Psychol. Abstr.*, 1939, 13, #1340.)
 240. WARDEN, C. J., & GILBERT, G. M. Testing animal intelligence. New York: Warden & Gilbert Films, Columbia Univ., 1939. 460 ft., silent, monochrome, \$28 sale. (*Psychol. Abstr.*, 1940, 14, #241.)
 241. WARDEN, C. J., & JACKSON, T. A. Development of behavior of the white rat. New York: Warden & Gilbert Films, Columbia Univ., 1938. 210 ft., silent, \$13 sale. (*Psychol. Abstr.*, 1939, 13, #1341.)
 242. WEINSTEIN, B. Color-categorizing behavior by monkeys. Glenview, Ill.: Coronet Productions, Inc., 1941. 400 ft., sound, color, \$65 sale. (WEINSTEIN, B. Matching-from-sample by rhesus monkeys and by children. *J. comp. Psychol.*, 1941, 31, 195-213; Color-categorizing behavior in monkeys. *Psychol. Bull.*, 1941, 38, 612-613.)
 243. WERNER, H. Analysis of visuomotor performance by a new marble board test. Northville, Mich.: Wayne County Training School, 1940. 400 ft., silent, monochrome, sale price on request.
 244. WILLIAMSON, E. G., & HAHN, M. E. Aptitudes and occupations. Glenview, Ill.: Coronet Productions, Inc., 1941. 600 ft., sound, monochrome, \$60 sale.
 245. WOODARD, S., & WOODARD, H. Deadly females. New York: W. O. Gutlohn, 35 W. 45th St., 1936. 360 ft., sound, monochrome, \$50 sale, \$1.50 rental.
 246. WOODARD, S., & WOODARD, H. Hermits of crabland. New York: W. O. Gutlohn, 35 W. 45th St., 1936. 400 ft., sound, monochrome, \$50 sale, \$1.50 rental.
 247. WOODARD, S., & WOODARD, H. Living jewels. New York: W. O. Gutlohn, 35 W. 45th St., 1936. 400 ft., sound, monochrome, \$50 sale, \$1.50 rental.

248. WOODARD, S., & WOODARD, H. Neptune's mysteries. New York: W. O. Gutlohn, 35 W. 45th St., 1936. 400 ft., monochrome, \$50 sale, \$1.50 rental.
249. WOODARD, S., & WOODARD, H. Underground farmers. New York: W. O. Gutlohn, 35 W. 45th St., 1936. 400 ft., sound, monochrome, \$50 sale, \$1.50 rental.
250. WUNDER, C. The seeing eye. New York: Skibo Productions, 1270 Sixth Ave., 1938. 400 ft., sound, monochrome, \$30 sale.
251. YOUNG, P. T. Technique for the study of food preferences of the white rat. Urbana: Department of Psychology, Univ. Illinois, 1937. 150 ft., silent, monochrome, \$7.50 sale.

Film Sources and Literature

252. AMERICAN COUNCIL ON EDUCATION. Films on war and American policy. Washington: Publications Division, 744 Jackson Place, 1940. \$0.50.
253. ANON. Three dimensional projection. *Leica*, 1938, 7, 6-7, 20, 22.
254. ASSOCIATION OF DOCUMENTARY FILM PRODUCERS. Living films. New York: Association of Documentary Film Producers, Inc., 56 W. 45th St., 1940. \$0.50.
255. ASSOCIATION OF SCHOOL FILM LIBRARIES. Annual catalog. New York: Association of School Film Libraries, Inc., 9 Rockefeller Plaza, 1941. \$5.00 (which includes Association membership).
256. ASSOCIATION OF SCHOOL FILM LIBRARIES. March of time (16-mm. versions). New York: Association of School Film Libraries, Inc., 9 Rockefeller Plaza, 1939. \$5.00 (which includes Association membership).
257. BECK, L. F. A review of sixteen-millimeter films in psychology and allied sciences. *Psychol. Bull.*, 1938, 35, 127-169.
258. BELL & HOWELL. Catalog of filmsound library. Chicago: 1801-15 Larchmont Ave., 1940. \$0.25.
259. BELL & HOWELL. Medical and dental films. Chicago: 1801-15 Larchmont Ave., 1939. \$0.50.
260. BRANDON FILMS. The blue list. New York: 1600 Broadway, 1941. Free.
261. BRITISH FILM INSTITUTE. The monthly film bulletin. London: 4 Great Russell St., 1940. 7s.6d.
262. COLLEGE FILM CENTER. Catalog of classroom films. Chicago: 59 E. Van Buren St., 1941. Free.
263. COOK, D. E., & RAHBK-SMITH, E. C. Educational film catalog. New York: H. W. Wilson Co., 1941. \$2.00.
264. DALE, E., & TYLER, I. K. The news letter. Columbus: Bureau of Educational Research, Ohio State Univ., 1941. Free.
265. EDUCATIONAL SCREEN. 1000 and one, the blue book of non-theatrical films. Chicago: 64 E. Lake St., 1940-1941. \$0.75.
266. FILMS, INC. Films of distinction. New York: Films, Inc., 330 W. 42nd St., 1941. Free.
267. FORD, A. The psychological cinema register. Bethlehem, Pa.: 1457 Main St., 1941. Free.
268. GUTLOHN, W. O. Education films. New York: 35 W. 45th St., 1940. Free.
269. LAND, E. H. Vectographs. Images in terms of vectorial inequality and their application in three-dimensional representation. *J. opt. Soc. Amer.*, 1940, 30, 230-238.

270. MUSEUM OF MODERN ART. Film bulletin. New York: 11 W. 53rd St., 1940. Free.
271. PROGRESSIVE EDUCATION ASSOCIATION. The human relations series of films. New York: Commission of Human Relations, Progressive Education Association, 71 Washington Square South, 1940. \$0.25.
272. SOCIETY FOR VISUAL EDUCATION, INC. Chicago: 100 E. Ohio St.
273. STONE, C. H., VALENTINE, W. L., & MILES, W. The production of 16-mm. motion picture films. *Psychol. Bull.*, 1940, **37**, 29-59.
274. TEACHING FILM CUSTODIANS. Catalog of films for classroom use. New York: 25 W. 43rd St., 1940. \$0.50.
275. THREE DIMENSION CORPORATION. New Holstein, Wisconsin.
276. WARDEN, C. J., & GILBERT, G. M. Instructional films in psychology. New York: Department of Psychology, Columbia Univ., 1941.
277. WEHBERG, H. Culture groups in American life: a film survey. New York: Metropolitan Motion Picture Council, 100 Washington Square East, 1939. \$0.25.
278. WEHBERG, H. Films of everyday life. New York: Metropolitan Motion Picture Council, 100 Washington Square East, 1938. \$2.00.

BOOK REVIEWS

PINTNER, R., EISENSEN, J., & STANTON, M. *The psychology of the physically handicapped*. New York: Crofts, 1941. Pp. vii + 391.

An evaluation of this book is to be made with a clear recognition of the fact that it is designed as an introductory textbook covering a relatively undefined and undeveloped field. The authors could not assume any very considerable sophistication on the part of many of their readers. As a result, they have produced a book which may be summarized by substituting "physically handicapped" for "blind" in Dr. Pintner's concluding remarks in his chapter on the blind:

From this summary we can see that a good beginning has been made in the psychology of the blind. More knowledge and more accurate knowledge as to the capacities, abilities, and personality traits of the blind will help us to understand them better and to educate them better.

The relative lack of sophistication on the part of their prospective readers served, perhaps, as a source quite as much of relief as of perplexity to the authors.

A basic aspect of the authors' point of view is expressed in the preface in these words: "In one sense there is no special psychology of the physically handicapped individual as contrasted with the individual without any serious physical impairment. The same psychological mechanisms are at work in all cases." In other words, the physically handicapped are just as mysterious as other people. Accordingly, the first three chapters by Dr. Eisenson are given over to a general discussion of personality development, mental hygiene, and the internal mechanisms of behavior. For students with adequate background in the areas covered, these chapters are probably not essential; for other students, the material presented might well be liberally extended, particularly by way of including additional discussion of remedial principles and procedures. One gets the impression that these chapters are intended as orientational, but, as the rest of the book makes abundantly clear, they deal with problems that are actually in the foreground of the psychology of the physically handicapped. As a matter of fact, if the book may be said to have a major shortcoming, it lies in the absence of a relatively thorough treatment of the problem of personality adjustment, particularly from the remedial or re-educational standpoint, a problem more important, perhaps, than any other from the point of view of the handicapped individual himself.

Another and closely related point that should be mentioned is the fact that these authors, like practically all others in the same field, neglect the point of view of the parents of the handicapped child. If anyone is looking for a gravely needed unwritten book, it is one which will treat as adequately as possible the almost unnervingly persistent problems which certain types of physically exceptional children unwittingly create for their distraught parents, and which must be dealt with in the home. The

prospective teacher of the handicapped could well be prepared to help parents in meeting some of these problems.

Dr. Pintner's survey of available psychological tests that have been designed or adapted for use with particular handicapped groups is very informative and meets a pressing need, since many of the standard measuring instruments are quite inappropriate for use with the blind, deaf, crippled, certain speech defectives, etc. In four other chapters Dr. Pintner summarizes clearly and comprehensively the studies that have been done on the intelligence, educational achievement, vocational and social adjustment, and personality characteristics of the deaf, hard of hearing, blind, and partially seeing.

The crippled and such other groups as the malnourished, epileptic, encephalitic, diabetic, allergic, cardiopathic, and tuberculous are discussed by Dr. Stanton. The need for a great deal of further research in these areas is made especially apparent.

Dr. Eisenson's discussion of speech defectives in the last two chapters is limited almost entirely "to speech disturbances which are known or thought to have organic bases." Readers who are not careful or previously informed may get the erroneous impression from these chapters that nearly all speech defects are organically determined. This reviewer was particularly struck in this connection by the discussion of stuttering, in which only theories positing "special organic conditions" (those of Travis, West, and Eisenson, respectively) are presented! This is in keeping with the design of the book as a whole, of course, but it might well give many readers an impressively distorted point of view with regard to stuttering. Moreover, with regard to stuttering, it so happens that a very large number of research investigations have been made and several hundred published references are available, of which only nineteen are listed—and none of these is from the *Journal of Speech Disorders*, in which most of the studies of stuttering have been published since 1936. This particular section of the book definitely needs to be supplemented by the addition of much more factual data, as well as a more rigorous theoretical treatment of the problem.

As a survey, on an elementary level, of a tremendously vast field, this book will serve quite well the needs of many students. Most of the bibliographies, one at the end of each chapter, are sufficiently representative to direct the student into a balanced program of supplementary reading. It is a book, however, which most instructors would want to use as primarily an outline for a course—as the menu rather than the *pièce de résistance*.

WENDELL JOHNSON.

University of Iowa.

BOOKS AND MATERIALS RECEIVED

BRENNAN, R. E. Thomistic psychology: a philosophic analysis of the nature of man. New York: Macmillan, 1941. Pp. xxvi+401.

BUROS, O. K. (Ed.) The second yearbook of research and statistical methodology. Highland Park, N. J.: Gryphon Press, 1941. Pp. xx+383.

GARD, H. V. Infinite man. Boston: Bruce Humphries, 1941. Pp. 291.

GERMANE, C. E., & GERMANE, E. G. Personnel work in high school: a program for the guidance of youth—educational, social, and vocational. New York: Silver Burdett, 1941. Pp. xv+599+index.

JONES, D. M. The Keystone method of teaching reading: an adaptation of lantern slides and the stereopticon to the teaching of reading in Grade One. Meadville, Pa.: Keystone View, 1941. Pp. ix+136.

PENFIELD, W., & ERICKSON, T. C. (with Chap. XIV by H. H. Jasper and Chap. XX by M. R. Harrower-Erickson). Epilepsy and cerebral localization: a study of the mechanism, treatment and prevention of epileptic seizures. Springfield, Ill.: Thomas, 1941. Pp. x+623.

ROBINSON, F. P. Diagnostic and remedial techniques for effective study. New York: Harper, 1941. Pp. ix+318.

RUCH, F. L., MACKENZIE, G. N., & MCCLEAN, M. People are important. Chicago: Scott, Foresman, 1941. Pp. xii+283.

STREET, R. F. Children in a world of conflict. Boston: Christopher, 1941. Pp. 304.

TODD, J. E. Social norms and the behavior of college students. *Teach. Coll. Contr. Educ.*, No. 833. New York: Bureau of Publications, Teachers College, Columbia Univ., 1941. Pp. ix+190.

NOTES AND NEWS

DR. PETER SANDIFORD, professor of educational psychology and director of educational research in the College of Education, University of Toronto, died on October 12, 1941, at the age of 60.

IN memory of James Hervey Hyslop and Walter Franklin Prince, the AMERICAN SOCIETY FOR PSYCHICAL RESEARCH has established a FELLOWSHIP of \$1250, to be awarded to a postdoctoral or predoctoral student of psychology. In the case of applicants who have not received the Ph.D. degree, the completion of all work other than the dissertation is required.

The Fellowship is designed to make possible the intensive investigation of a problem in parapsychology and to acquaint the Fellow at first hand with the nature of the research field. An original research project should be submitted at the time of application. A research fund of \$250 will be available to the Fellow in addition to his stipend. The Fellowship year must be spent in New York City.

In order to permit the candidate to carry on study and research in other fields, the Fellowship is defined as involving two-thirds time; the other one-third can be given either to physiological or to social psychology.

The Fellowship will be awarded on the basis of (1) the research program submitted; (2) a competitive examination emphasizing general experimental psychology, the psychology of personality, abnormal and clinical psychology, physiological psychology, and statistics; (3) an examination in psychical research upon the following: Coover, J. E. *Experiments in psychical research at Leland Stanford University*; Gurney, E., Podmore, F., & Myers, F. *Phantasms of the living* (2 Vols.); *Journal of Parapsychology* (Vols. I-V); Kennedy, J. L. *Psychological Bulletin*, 1939, 36, 59-103; Pratt, J. G., Rhine, J. B., Smith, B. M., Stuart, C. E., & Greenwood, J. *Extra-sensory perception after sixty years*; (4) a personal interview with the Research Committee.

The closing date for receipt of applications will be January 31, 1942. Applicants will shortly thereafter be consulted about convenient times and places for the examination and the interview. In case the applicant's residence is too far from New York to make a personal interview feasible, the Research Committee will accept the report of any experimental psychologist acquainted with the applicant and capable of evaluating the likelihood of his doing an effective piece of research. The award will be made on March 1, 1942.

The Fellowship is to be administered by a Committee of the American Society for Psychical Research, consisting of Dr. George H. Hyslop, 129 East 69th Street, New York City; Dr. Edwin G. Zabriskie, Neurological Institute, Fort Washington Avenue and 168th Street, New York City; Dr. Gardner Murphy, Chairman of the Committee, The College of the City of New York, 139th Street and Convent Avenue, New York City. More details can be obtained by writing to the Chairman of the Committee.

THE WASHINGTON-BALTIMORE BRANCH of the American Psychological Association held the first meeting of the academic year 1941-1942 at Wilson Teachers College, Washington, D. C., on October 30, 1941. Papers were presented by: Dr. Steuart Henderson Britt, George Washington University; Dr. Jerome S. Bruner, Federal Communications Commission; and Mr. Luigi Petrullo, Social Security Board.

THE Nineteenth Annual Meeting of the AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, an organization for the study and treatment of behavior and its disorders, will be held at the Hotel Statler, Detroit, Michigan, on February 19, 20, and 21, 1942. Copies of the preliminary program may be obtained from Dr. Helen P. Langner, Vassar College, Poughkeepsie, New York. A registration fee will be charged for nonmembers.

THE one-hundredth anniversary of the opening of the COLLEGE OF LITERATURE, SCIENCE, AND THE ARTS OF THE UNIVERSITY OF MICHIGAN was celebrated at Ann Arbor on October 15, 1941. The various achievements of the College in language and literature, science, and the social sciences, and other features of the development of the College were discussed at a morning session, while the afternoon session was devoted to a discussion of the problems and future of liberal arts education in the United States. Luncheon and dinner programs were also held. The celebration was concluded with a Convocation in the evening which was addressed by Dr. James Rowland Angell, President-emeritus of Yale University and educational counsellor of the National Broadcasting Company. Dr. Angell is an alumnus of the University and the son of a former President of the University.

Psychological Bulletin

THE GLOMUS BODY AS A RECEPTOR OF CUTANEOUS PRESSURE AND VIBRATION

BY B. VON HALLER GILMER

Carnegie Institute of Technology

I. INTRODUCTION

In the enormous amount of literature on the sensitivity of the body to vibratory stimulation no consideration, other than speculative, has been given to the possible receptors of vibration. In fact, even the nature of the processes underlying the perception of vibration has long been the subject of controversial interpretation. Some writers have maintained that vibratory sensibility is mediated by the bones and periosteum, some have postulated a special "vibratory sense," and other writers have considered the perception of vibration to be a function of the tactual end-organs responsible for "contact" and "pressure." A review of the literature on the perception of mechanical vibration and an account of the theoretical interpretations of vibratory sensibility have been given in a recent series of papers by Geldard (10, 11, 12, 13). A review of the literature on the perception of vibration induced by electrical currents can be found in a 1937 publication by Von Skramlik (26).

An examination of the experimental findings on general vibratory sensibility leads the writer to believe that there may exist different kinds of mechanisms for mediating vibratory perceptions. The recent investigations of Geldard (11), Gilmer (15), Piéron (24), and Weitz (30) have concurred with the early views of Von Frey (9) and others that cutaneous vibratory sensibility is but another temporal expression of pressure. The work of Echlin and Fessard (8) on the response of "stretch receptors" in frogs, cats, and rabbits, however, would seem to leave open the possibility of kinaesthetic mediation of vibration in man. Perhaps other mechanisms may be involved in the general perception of vibration, but in the present investigation our consideration has been an attempt to determine the receptor or receptors of *cutaneous* vibration as another temporal expression of pressure sensitivity.

Aside from such inadequately supported guesses as that Meissner corpuscles and the corpuscles of Pacini may function in the reception of pressure and vibration, little consideration has been given to possible pressure-vibration receptors. The attempts that have been made to establish correlations between the various cutaneous sensory qualities of pressure, pain, and temperature and their possible receptors have, on the whole, been inconclusive.

The attempts that have been made to find the relationship between possible sense receptors in the skin and the several cutaneous sensory qualities have involved two different kinds of excision studies—"direct" and "indirect." The term "direct" excision may be used to describe the removal and the histological analysis of cutaneous tissue directly underlying a specific skin area or sensory "spot." "Indirect" excisions may be described as those including an histological analysis of comparatively large skin areas taken from surgical specimens without predetermining precise sensory "spots," or the analysis of rather large skin areas containing a number of known sensory "spots" but without attempting to specifically correlate a given sensory "spot" with the tissue directly underlying it. For purposes of this paper only the results of the "direct" excision investigations are reviewed.

In 1885 Donaldson (7) performed the first "direct" excision experiment when he made an histological examination of the tissue underlying cold spots and warm spots. Since no specialized end-organs were found beneath the sensory spots, the results of this investigation were interpreted as being "negative." One year later Goldscheider (17) examined histologically tissue containing warm, cold, and pressure-sensitive spots removed from the forearm. He reported finding no corpuscular nerve endings but different forms of arborized nerve tissue. Goldscheider found it difficult anatomically to distinguish between the nerve terminations corresponding to the warm and cold spots, but regarded the plexus as underlying a temperature sense and having a specific relation to blood vessels. Haggqvist (21), in 1913, reported finding smooth muscle bundles under cold spots.

In 1923 Stetson (27) reported a series of experiments dealing with the relationship existing between the hair follicle and the sense of pressure. These investigations were made with the hairs on the scrotum. Stetson concluded that pressure sensation in this hairy region is mediated by the upper part of the follicle and possibly by the skin surface at the point of emergence. He also maintained that inducing a deformation of the skin surface near the point at which the hair emerges can excite these endings. Strughold and Karbe (28), in 1925, working on the conjunctiva of the eye, suggested a relationship between the cold spots and Krause end-bulbs. But whether one can apply this correlation in dealing with the external skin is in question.

In 1927 Dallenbach (4) found in serial sections taken from excisions of cold and warm spots only free nerve endings. He concluded that these, besides functioning in pain, also subserve the functions that Von Frey reservedly ascribed to Krause end-bulbs and Ruffini cylinders. One year later Pendleton (23) reported that no specific end-organ was found in biopsies containing cold sensitive tissue.

Waterston (29), in 1933, explored the terminal part of the fingers for touch, pain, and temperature sensation. The epidermis was then removed by slicing. He reported that no pain, but only touch, was sensed by this removal. Histological examination of the removed portions of the epidermis were made. Fine nerve fibers were found, terminating in the epidermis in "loops and figures." Waterston concluded that this demonstration of the presence of nerve fibers and their terminals in the tissue which had been removed, without causing any pain, completes the evidence necessary to establish the theory that the nerves of the epithelium are the nerves of light tactile sensation and that they do not under ordinary conditions convey impulses which give rise to pain. Waterston does not consider pressure to be a cutaneous sensation. He maintains that pressure is elicited on the surface of the skin if stimulation is sufficiently strong to affect deeper tissues such as the muscle or the periosteum. The possible organs of temperature sensation were not revealed by these excision experiments.

Conducting excision studies on the mammary gland, Belonoschkin (1), in 1933, attributed to a nonencapsulated ending, situated 0.1 to 2 millimeters below the epidermis, the mediation of cold sensation. These endings were apparently similar to those reported by Woollard (32) in 1935. Working with sections of skin on the volar surface of the forearm, Woollard found immediately in the vicinity of the cold spots a complicated nerve plexus lying subjacent to the epithelium and just above the loops of the capillaries. This plexus consisted of fibers of moderate thickness which branched and subdivided in a diffuse manner. The terminations were of the form of expansions of considerable size, sometimes elongated and sometimes ovoid. The ends were nonencapsulated, although they were close enough together to give the impression of a well-localized ending.

II. PRESSURE-VIBRATION SPOTS AND THEIR UNDERLYING TISSUES¹

Although both "direct" and "indirect" excision studies have not convincingly shown any specific relationships between the various cutaneous sensations and their possible receptors, we became interested in making another attempt along this line. Many writers have regarded most, if not all, of the excision investigations

¹ The material in this section of the paper is the joint work of Dr. S. R. Haythorn and the writer. For a detailed description of the methods of surgical extirpation, the histological techniques employed, and for a full description of the tissues found in each biopsy, the reader is referred to our original publication (16).

as giving "negative" results. But a careful perusal of some of the extirpation studies will show that the findings were "negative" only in the sense that specific receptors were looked for and not found.

Recent advancements in the methods of locating sensory areas on the surface of the skin and improved histological techniques further added to our interest in the problem of attempting to identify the receptors of cutaneous pressure and vibration.

Localization and Excision of the Sensory Areas

The methods employed in localizing the pressure-vibration sensitive spots have been described in detail in an earlier publication by Gilmer (15).

Two methods of locating these spots were used.² One involved the application of amplified alternating electrical currents, generated from a beat-frequency oscillator, to the surface of the skin by a small needle electrode. The apparatus was provided with a voltmeter and milliammeter for measuring sensory thresholds in terms of power. Using this method, one can localize pressure-vibration sensitive spots with accuracy, since these electrical stimulations elicit various patterns either of pain associated with feelings of vibration or of vibration free of pain experiences. Vibration sensations are here defined as those giving only clear perceptions of interrupted pressure, the vibratory "pattern" entirely free from all pain experiences. Thus, through applying the alternating electrical currents to the surface of the skin by the needle electrode, one can easily "tune in" the pressure-vibration spots. Exploring the skin for pressure-vibration spots in this manner offers certain advantages over trying to localize pressure spots by means of hairs or other conventional esthesiometers.

The second method of localizing the pressure-vibration sensitive spots made use of a mechanically vibrated needle powered by the amplified current from a beat-frequency oscillator. After the general area of vibratory sensitivity had been determined by using the alternating electrical currents, the point or points of maximum sensitivity to mechanical vibration were determined. Thresholds were measured in terms of amplitude swing of the needle. The actual frequency of the vibrating needle while in contact with the skin and the extent of the mechanical transmission of vibratory "waves" through the tissues was determined stroboscopically. In exploring the skin for the vibration-sensitive spots, a frequency of 100 cycles was arbitrarily used. However, before excisions were made, the frequency range for each sensitive area was determined.

After the vibration-sensitive spots had been determined by the above methods, each spot was tested for pressure sensitivity by the use of a hair

² Appreciation is expressed here to Mr. Irwin Rosenberg, who aided in this part of the experiment.

esthesiometer. In general this latter procedure confirmed the localizations obtained by the electrical and mechanical vibration stimulations.

Each pressure-vibration sensitive spot was marked by the Dallenbach injection technique (6), and the sensitivity of each was checked periodically for several weeks. The spots were found to remain stable in their position, and they yielded virtually the same vibratory thresholds from day to day. Before the excisions were made, each spot was tested for temperature sensitivity.

Nine "direct" excisions were made in our investigation, the biopsies being removed from two subjects who were well trained in the observation of cutaneous sensitivity. Of these nine biopsies, taken from regions of the back and arms, three contained only pressure-vibration sensitivity; two were highly sensitive to cold stimulation in addition to having pressure-vibration sensitivity; and two contained tissues sensitive to warmth along with sensitivity to pressure and vibration. The two remaining biopsies were taken as "controls." We were unable to find skin areas large enough for adequate excision that were completely free from sensitivity to pressure, vibration, and temperature. Therefore, our "control" biopsies contained tissues which were relatively insensitive to mechanical vibration, pressure, and temperature stimulation, and which transmitted primarily feelings of pain in response to the electrical stimulation.

The excisions, some two to three millimeters in diameter, were made with a scalpel.³ In each biopsy the pressure-vibration sensory "stimulus point" was localized near the center of the surface area. The skin tissue was removed in a conical shape, the biopsies ranging in depth from about two to six millimeters. The deeper excisions went well below the dermic level into the subcutaneous fatty tissue. The more shallow excisions went only through the dermic layer of the skin. Each biopsy was removed under local novocain anaesthesia, the anaesthetization having no effect upon the histological techniques used. Immediately upon the removal, the excised tissue was placed in a fixing solution.

In order that each biopsy should be investigated thoroughly, a routine search of each section was made layer by layer for the following structures:

The Malpighian layer was studied for free filaments of nonmedullated nerve fibers, for filaments ending in the tactile discs of Merkel-Ranvier, and for the argentophile Langerhans cells.

The corium was searched for arborized terminal branches of networks of nonmedullated fibers, especially for those immediately beneath the Malpighian layer, for end-brushes of Ruffini, for angular swellings of the filaments, for endings in and on the vascular walls, for independent glomeruli in the connective tissues, and for the encapsulated end-organs including Meissner's corpuscles, Ruffini's cylinders, Krause's end-bulbs, and the end-bulbs of Pacini.

Perivascular arborizations were traced from section to section. Their networks and disc-like endings were sought in and about arterioles, capillaries, and venules.

³ Dr. Joseph Soffel, of the West Penn Hospital, Pittsburgh, made the surgical excisions.

All sections were examined for arterioles of the glomic type and for portions of Sucquet-Hoyer canals, which often lead upward from the more deeply-seated glomus bodies of Masson.

Hair follicles, sebaceous glands, sweat glands, and arrectors pili muscles were carefully examined with reference to their nerve supplies. Myelinated nerve bundles were followed for divisions and their relation to other structures.

Individual Biopsies

The nine biopsies described below contain, in order, three which had only pressure-vibration sensitivity, two which were cold sensitive in addition to pressure-vibration sensitivity, two which were sensitive to warmth in addition to their pressure-vibration sensitivity, and two "controls" which were relatively insensitive to pressure, vibration, and temperature stimulation.

Pressure-Vibration Biopsy (s-39-266A). This biopsy was removed from near the middle of the back. The stratum Malpighii showed a considerable number of argentophile cells. Free, nonmedullated plexus were found just beneath the Malpighian layer, and these appeared to be continuous with those about the capillary walls. Perivascular plexus were abundantly arranged about arterioles, capillaries, and venules and appeared to be the chief channels for the passage of the nerve fibers through the corium to the Malpighian layer. Among the vessels was an arteriole having several layers of cubical, smooth-muscle cells and no internal elastic membrane. It was believed to be an arm-like extension from a glomus body. The biopsy contained one hair follicle with sebaceous glands, two arrectors pili muscles, and one sweat duct. A medullated nerve was seen to divide and connect with a plexus about an arteriole. Serial sections failed to show Meissner's corpuscles, Krause's end-bulbs, Ruffini's cylinders, or Pacinian corpuscles.

Pressure-Vibration Biopsy (s-39-266). This biopsy was removed from the left side of the back near the belt line. The Malpighian layer contained many argentophile, crescent-shaped, Merkel-Ranvier cells. Non-medullated fibers were not seen in the Malpighian layer, although the usual network of sub-Malpighian, arborized fibers was present about the capillaries. One of the vascular plexus contained a structure resembling the cross-section of an arteriovenous anastomosis, but no true glomus body was found. The biopsy contained three widely separated sweat-gland ducts and two bundles of arrectors pili muscles. No encapsulated sensory end-organs of any kind were found.

Pressure-Vibration Biopsy (s-39-387). This biopsy was removed from the left side of the back about 10 inches above the belt line. Some non-medullated nerve fibers extended for a very short distance into the Malpighian layer. Beneath the Malpighian layer was a small group of vessels having a very rich nerve supply. Free filaments were spread out beneath the epithelium. At the side of one of the coils of vessels both medullated and nonmedullated nerves could be seen. In the lower part of several

serial sections there was a portion of a true glomus. It appeared to be connected directly by vascular extensions to the subepithelial capillary plexus, and the perivascular nerves and the arborized subepithelial nerves were intimately associated. At the side of the glomus there was a small bundle of myelinated nerves. The piece contained one hair follicle, three sweat-gland ducts, and several small groups of arrectors pili muscles. No encapsulated end-organs were found.

Pressure-Vibration—Cold Biopsy (s-39-267). This biopsy was removed from the ventral surface of the left forearm midway between the wrist and the elbow. The Malpighian area was covered with a thick cornified layer and contained the mouths of several sweat ducts. Nonmedullated fibers were found entering the Malpighian layer. Crescent-shaped nuclei with vacuoles around them were accepted as Merkel's corpuscles. Silver-positive subcutaneous brushes of radiating fibers were found extending upward through the papillae into the Malpighian coat. One of the brushes occurred just at the end of a capillary at the tip of a papilla. Similar fibers followed the course of the capillary into the corium. Perivascular arborizations were present. There were several small loops having cubical or square muscle-cell coats suggestive of a loop of a Sucquet-Hoyer canal, save that they were not more than two layers thick. The biopsy contained two hair follicles, a sebaceous gland, two arrectors pili muscle bundles, and several sweat-gland ducts. There was a coil of sweat glands at the bottom of the section with a fairly large medullated nerve trunk and two loops of the muscular coils of a glomus body beside it. No encapsulated end-organs were found.

Pressure-Vibration—Cold Biopsy (s-39-814). This biopsy was removed from the ventral side of the arm near the wrist. The Malpighian layer showed the usual number of Merkel's cells. This section presented the most highly vascular, subepithelial zone of any biopsy studied. The vessels were unusually numerous, unusually superficial, and tended to run parallel to the Malpighian layer at right angles rather than perpendicularly. Many of the capillary walls were surrounded by a very loose network of reticulum and argentophile fibrils resembling nerve endings. At the tip of the section there was a group of vessels having slightly thicker walls than those just beneath the epithelium in which cubical-muscle cells and numerous nerve ends were found. It was either a part of a glomus body or one of the cubical-muscle extensions connected with a glomus body. At the base of the piece there was a bundle of medullated nerves. The glomus-like body had a myelinated nerve bundle at the side of it, and one small nerve could be seen to break up into a subepithelial plexus. A sweat-gland duct and two arrectors pili muscles were located near the center of the block. Encapsulated nerve end-organs and hair follicles were absent.

Pressure-Vibration—Warmth Biopsy (s-39-1897). This biopsy was removed from the dorsal side of the arm near the wrist. In the Malpighian layer there were cells of the Merkel-Ranvier type. No connection between these cells and nerve fibers could be traced with certainty. In the region of the papillae there were sprays of argentophile fibrils continuous with the reticulum and nonmedullated plexus of the corium. These

sprays were far more numerous in the regions of the papillae where they appeared to enter the Malpighian layer and radiate among the epithelial cells. The basement membrane was interrupted at the papillae. In the subcutaneous areas there were anastomoses of argentophile fibrils that surrounded the vessels. In some of the first of the serial sections there were several large hair follicles with coils of sweat glands, small nerve trunks with papillary muscles near them. At the lower border of the corium there were two vascular canals with smooth-muscle coats at right angles to their lumina. In the later sections of the series these two structures joined. Near the vessel there was a small bundle of medullated nerves. The vascular structure resembled a loop of a Sucquet-Hoyer canal. There were three vascular structures in this biopsy which resembled loops of Sucquet-Hoyer. The perivascular plexus were unusually abundant throughout the biopsy. No encapsulated end-organs were found.

Pressure-Vibration—Warmth Biopsy (s-9A and B). This biopsy was removed from near the middle of the back and was the only one which showed any of the original patterns of sensitivity after excision. Therefore, the tissue underlying this sensory spot was removed a second time, seven months after the first removal. The first excision went a depth of less than two millimeters. The second excision included the scar tissue which was formed by the first operation and went an additional depth of five millimeters. At the time of the first excision (A) the tissue was sensitive to pressure, vibration, and warmth. At the time of the second excision (B) pressure had diminished. Stimulation of the scar tissue by intense mechanical vibration gave the experience of the tissue "vibrating as a mass." No sensitivity could be elicited by the alternating electrical currents, since we were unable to establish electrical contact through the scar tissue. Two months after the first excision the spot was again highly sensitive to warmth stimulation.

(A) The block was small and cut parallel to the surface. Merkel-Ranvier cells were present. A few argentophile (Langerhans) cells stood out clearly. They appeared to be fixed epithelial cells in the basal layers. The vessels were of the ordinary arteriole-capillary types with the usual perivascular nerve reticula. The subepithelial reticulum was not stained. The section contained three hair follicles and sweat-gland ducts. No encapsulated end-organs were found. The piece was too superficial to be of much value.

(B) The Malpighian layer had completely regenerated, although the papillary layer was flattened for a short distance toward one side of the section, and the Malpighian layer over this area was not cornified. In this area the collagen was abundant, compressed, and with Masson's stain gave a staining reaction of scar tissue. There were three sets of hair follicles in the corium, one of which had a double shaft. Two sweat-gland ducts passed entirely through the corium and ended in sets of sweat-gland coils in the stratum subcutaneum. There were two somewhat tortuous arterioles having circularly arranged muscle coats. They were situated in the deeper layers of the reticular stratum, and one of them was accompanied by a medullated nerve trunk. No partial or complete glomus bod-

ies were present. The two vessels with circularly arranged muscle walls could have been related to glomus bodies, but they were not sufficiently typical to be identified as portions of Sucquet-Hoyer canals. The superficial vessels were of the usual arteriolar-capillary-venous type. No encapsulated end-organs were found.

"Control" Biopsy (s-39-386). This biopsy was relatively insensitive to pressure, vibration, and temperature stimulation. It was removed from near the middle of the back. The Malpighian layer contained many fibers that took up the silver stain. One fiber could be traced to a Merkel cell. There was a large arteriole of the ordinary type in the corium with many branches spreading out beneath the Malpighian coat and extending into the papillae. The argentophile reticulum about the vessels was heavily stained, and the nerve fibers could not be differentiated from the reticular fibrils in the silver preparations. There was a sweat-gland duct leading down through the center of the biopsy. No glomus bodies were found, and there were no encapsulated sensory end-organs.

"Control" Biopsy (s-39-815). This biopsy was relatively insensitive to pressure, vibration, and temperature stimulation. A good pressure-vibration spot was located near, but not included in, the biopsy. This biopsy was removed from the small of the back. Cells resembling Merkel's cells were present, although no nerve ends or fibers to Merkel's cells could be found. There was a rich argentophile reticulum just beneath the epithelium. The section was relatively nonvascular in so far as the subepithelial supply was concerned. The perivascular arborizations were loose and less noticeable than in the other biopsies. In one of the marginal sections there appeared to be a loop of vessel showing a thick, cubical-cell muscular coat of the type often associated with the Sucquet-Hoyer canals. It disappeared early and was not found in any of the remaining slides. There were several hair follicles, sweat glands, groups of arrectors pili muscles, and coils of small myelinated nerve trunks in the section. One Meissner corpuscle was found in this biopsy.

General Analysis of the Biopsies

In making an interpretation of the above findings, three things are in evidence:

- (1) These excision studies failed to substantiate the conventional claim that the cutaneous pressure qualities are mediated by specific sense receptors.

- (2) The possibility that the neurovascular system of the skin operates either in a direct or indirect manner in the mediation of cutaneous pressure and vibration is suggested by two findings:

- (a) The neurovascular system of the skin contains certain structural units richly endowed with a nerve supply surrounded by regions of less nerve concentration.
- (b) Biopsies taken from the skin areas highly sensitive to pressure and vibratory stimulation were found to contain a richer afferent-arterial nerve supply than

those biopsies taken as controls in which the tissue was less sensitive to pressure and vibration.

(3) The presence in several of the biopsies of spots sensitive to pressure and vibration of certain tubular, straight canals having muscular walls which appeared to unite the glomic bodies of the stratum subcutaneum with the capillary zone of the stratum papillare and the presence of this rich reticular nerve supply served to strengthen our postulation that the arteriovenous anastomoses, or glomus bodies, in the skin are in some way related to sensory interpretations.

Masson (22), in 1924, surmised that the glomus bodies may serve to mediate pressure sensitivity, since they are most numerous in skin regions in which there is a good sense of touch, and in the extreme parts of the digits they are most abundant and developed. Other than this observation by Masson no investigators have considered the possible sensory functions of the glomus body, as far as the writer has been able to determine, save for certain general postulations as to the sensory functions of the general neurovascular system. Since no descriptions of the glomus bodies have been found in the psychological literature, the writer feels that it is in order to give a brief historical account and description of these mechanisms before turning to further points of consideration.

III. THE GLOMIC UNIT OF THE NEUROVASCULAR SYSTEM

Much of the historical description of the glomus bodies or permanent arteriovenous anastomoses has been centered around their anatomical structures. Other concern has been given to their motor functions. Many accounts can be found in the literature describing glomus tumors, but relatively little mention has been made of the possible sensory functions of the glomus body. Extensive reviews of the literature dealing with the glomic units of the neurovascular system have been given by Popoff (25) and by Clark (2). Only a brief account of this historical material will be given here.

It is apparent from a study of the literature that early investigations of the vascular system led to certain theoretical beliefs that the growth of permanent arteriovenous anastomoses was very improbable. Perhaps this position in part accounts for the fact that well-established recognition of these structures has come only within the last two decades.

Clark (2) has pointed out that J. Müller, as early as 1844,

described direct connections between arteries and the cavernous sinuses of the penis. In 1862 Sucquet described direct connections about 0.1 millimeter in diameter between arteries and veins in man in the skin of the elbow, knee, lips, cheeks, nose, temple, eyelids, forehead, ears, fingers, toes, and thenar and hypothenar eminences. Sucquet spoke of these connections as a "circulation dérivative." Other investigators failed to find these connections described by Sucquet and considered them artifacts. However, in 1877 Hoyer reported finding these connections in several types of animals in the ear, nose, toes, and at the base of the nail. He found them in man only in the hand and foot and in the sex organs. Extensive studies of these connections in the ear of the rabbit showed that some were straight and others were coiled. According to Clark, the name "arteriovenous anastomosis" appeared first in the writings of Gerard in 1895.

Grosser, in 1902, gave the classical description of the histology of the arteriovenous anastomoses as found in the fingers and toes of man. In the beds of the nails and balls of the fingers and toes he found anastomoses measuring 10 to 30 micra, inside diameter, and 55 to 150 micra, outside diameter. Grosser was one of the first to emphasize the richness of the nerve supply of the arteriovenous anastomoses.

Many other investigators gave similar descriptions of the arteriovenous anastomoses following these earlier accounts. But it was not until 1924 that Masson brought these structures from a position of little more than academic interest to one of physiological and pathological significance. Masson was the first to describe certain pathological conditions connected with the normally present arteriovenous anastomoses.⁴ His descriptions of the painful tumors associated with these anastomoses have led to a vast amount of investigation of such tumors. Pathological literature contains many descriptions of glomus tumors as found in conditions of inflammation, arteriosclerotic gangrene, diabetic gangrene, and thromboangiitis obliterans. Other typical descriptions of such

⁴ The term "normally present" arteriovenous anastomoses is used in this connection to differentiate them from certain types of anastomoses caused by injuries with the resulting formation of connections between arteries and veins which may or may not become permanent. These latter anastomoses lack, in the main, the important neuromuscular mechanism found in the normally present structures. The references made to arteriovenous anastomoses in this paper refer to those normally present in the tissues of the body.

tumors can be found in the works of Popoff (25) and Grauer and Burt (20).

It was because Masson felt that a confusion might arise between the description of these pathological tumors and other unusual vascular connections which have received the same name that he suggested the use of the term "glomus tumors" instead of tumors of the arteriovenous anastomoses. And it follows that some writers began to speak of the normal arteriovenous anastomosis as the "glomus." In 1935 Masson spoke of "les glomus cutanes de l'homme." Two years later, in view of the richness of the nerve supply of the glomus, he used the term "les glomus neurovasculaires." The term "body" has also been used in connection with the glomus. For purposes of description and with a view to avoiding a possible confusion between arteriovenous anastomoses found normally in the subcutaneous and dermic regions of the skin and the anastomoses found in other bodily tissues, the writer prefers to speak of *cutaneous glomus bodies*.

Although the cutaneous glomus bodies vary as to size, shape, and distribution, each contains certain characteristic anatomical structures which mark them as distinct units of the neurovascular system. One of the most complete descriptions of these structures has been given by Popoff (25).

Popoff has described the digital glomus as a specifically constructed and specifically located system. Histologically, the Sucquet-Hoyer canal is one of the easier parts of the structure to identify, and Popoff describes this canal as a main part of the glomus. Popoff summarizes the essential characteristics of the Sucquet-Hoyer canal and the entire digital glomus as follows:

- (1) The glomic system occupies a definite zone in the cutis.
- (2) One afferent glomic artery forms from one to four separate Sucquet-Hoyer canals.
- (3) The beginning of the Sucquet-Hoyer canal is marked by the presence in the afferent artery of cushion-like endotheliomuscular elevations, the function of which is to direct the blood flow into the Sucquet-Hoyer canals and preglomic arterioles.
- (4) The wall of the Sucquet-Hoyer canal is rather thick and has a specifically arranged structure.
- (5) The Sucquet-Hoyer canal is free from elastic tissue, with the exception of its proximal part.
- (6) The Sucquet-Hoyer canal is surrounded with a clear, wide zone consisting of loose, fine collagenous reticulum enclosing a rich network of nonmedullated nerve fibrils. This clear zone may be considered as an expansion zone which is furnished with a neuroreticular mechanism controlling the function of the Sucquet-Hoyer canal.

(7) The glomic unit is supplied with a specifically arranged system of preglomic arterioles, which nourish all the constituents of the glomus and form an integral part of a functional glomic unit.

(8) Primary collecting veins, though lacking in musculature, are richly supplied with elastic tissue. They collect blood not only from the Sucquet-Hoyer canal but also from the preglomic arterioles. Being long and wide, they encircle the glomic unit and thus form a voluminous receptaculum, which has a highly developed surface area.

(9) The entire glomus is surrounded with coarse, lamellated collagenous tissue, which separates the glomus from other structures of the cutis.

Figure 1 shows a schematic drawing of the glomus and some of its constituents.

Studies of the motor functions of the glomus began about 1930

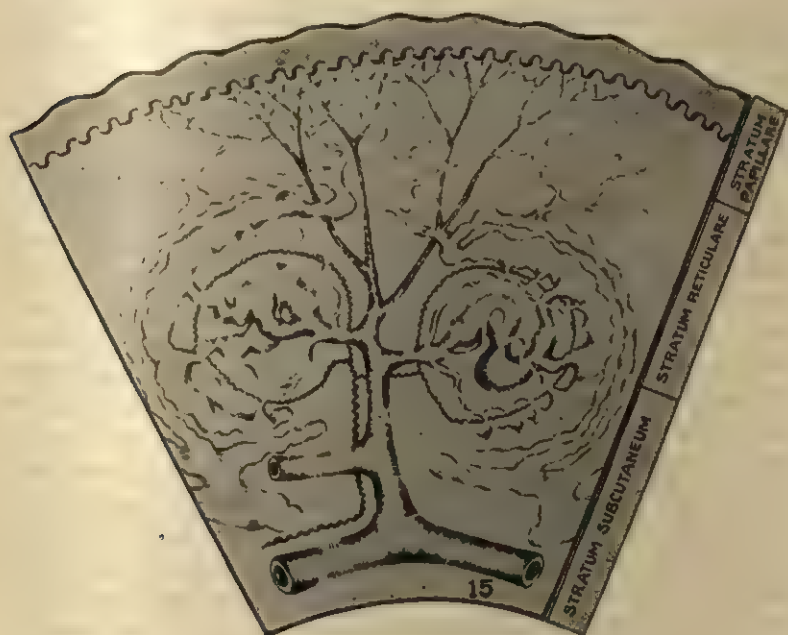


Fig. 1. Diagrammatic presentation of vascular arrangement and the glomus, as found in the ventral surface of the digit. It shows: (1) all the zones of the skin, including that occupied by the glomic apparatus; (2) the afferent artery of the glomus; (3) the coiled type of Sucquet-Hoyer canal, characterized by a thick wall; (4) the efferent part of the Sucquet-Hoyer canal entering the primary collecting vein, with the latter appearing as a long, wide ruffle encircling the glomus; (5) the relation of the primary collecting vein to other veins; (6) the system of preglomic arterioles supplying all the constituents of the glomus and emptying into the primary collecting vein; and (7) division of the periarterial nerve trunks, with branches going to the glomus.

(Reproduced, with permission, from N. W. Popoff, *Arch. Path.*, 1934, 18, 306; 307.)

with the work of Grant (18). Using the intact ears of living albino rabbits, he found it possible to see occasional arteriovenous anastomoses by means of pulsation at their point of entry into the vein when they were dilated. In fixed and stained preparations he demonstrated that such pulsation points were true arteriovenous anastomoses. Grant observed that the anastomoses dilated when the body temperature of the rabbit was raised, and they closed under conditions of cooling. He further showed that local mechanical stimulation, acetyl-cholin, and histamine caused dilatation, while adrenalin and faradic stimulation of the sympathetic produced constriction of the anastomoses. Grant concluded that arteriovenous anastomoses are important in regulating body temperature. Under conditions of overheating they aid in heat loss by allowing an enormous blood flow through the ear of the animal, the reverse being true under conditions of cooling.

Grant and Bland (19) recorded the temperature of the skin of the fingers of man at several different places while the tip of the finger was held in ice water for a period of time and then warmed. They concluded that the arteriovenous anastomoses of the fingers are active in contraction and dilatation and function in the temperature changes of the skin of the finger. Clark and Clark (3), using the ingenious method of observing the motor functions of the anastomoses in the rabbit's ear by means of transparent windows, have confirmed the assertions that the anastomoses dilate and contract under conditions of warming and cooling. Their behavior was shown to have much in common with the motor functions of the arteries and arterioles, the chief difference in function being one of degree. The arteriovenous anastomoses were more active and showed a greater tendency to independent action than the arteries and arterioles. These latter data are interesting in light of Masson's early observations that these glomus bodies are more richly supplied with nerves than are the corresponding arterioles.

That the glomus bodies serve motor functions in regulating body temperature, both local and general, is generally agreed. Precisely how this regulation is effected is at present a matter of speculation.

IV. EVIDENCES THAT THE CUTANEOUS GLOMUS BODIES FUNCTION IN THE MEDIATION OF PRESSURE AND VIBRATION

From the evidence obtained through our "direct" excision experiments and the data gathered "indirectly" through histological

analysis of surgical specimens, the writer postulates that the cutaneous glomus body functions as a receptor of cutaneous pressure and vibration, if not as the receptor of these sensations. This postulation is supported by several secondary sources of evidence.

Glomus Body Distribution

The distribution of the cutaneous glomus bodies throughout the skin shows a marked comparison to the known distribution of pressure-vibration sensitivity of the skin. For example, the palmar surfaces of the hands and the soles of the feet are areas almost uniformly sensitive to pressure and to vibration, and it is known that here the cutaneous glomus bodies are very numerous. On the other hand, the dorsal surface of the fingers is comparatively insensitive to pressure and vibration, and here one finds relatively few glomus bodies. Again, the fingernail is very sensitive to mechanical vibration, and it is known that the nail bed is richly supplied with these structures. Other studies on the distribution of cutaneous glomus bodies apparently warrant the conclusion that the skin regions most generally sensitive to the mediation of the pressure qualities are also those regions richly endowed with glomic units of the neurovascular system. And those skin regions which have comparatively few pressure-vibration spots also have comparatively few glomus bodies. It is also interesting to note that on regions of the skin where the two-point limen of pressure is small, more glomus bodies are found than on those regions where the two-point limen is large.

There is some disagreement among the various investigators as to the actual number of glomus bodies present in any given region of the skin. But suffice it to say that all investigators agree that the regions of the hands and toes are abundantly supplied with these structures. A few figures from these quantitative studies may be of interest.

Grant and Bland (19) give the following distribution of the glomus structures per square centimeter area of the hand: nail bed of index finger, 501; tip of index finger, 236; palmar surface of third phalanx, 150; palmar surface of second phalanx, 20; palmar surface of first phalanx, 93; thenar eminence, 113; and hypothenar eminence, 96. Their figures per square centimeter of the second toe of the foot show: nail bed, 593; pad, 293; sole near heel, 197. Popoff (25) gives lower figures than these. He points out that the quantitative results of such studies are influenced by a number of factors of which age of the individual and the pathological processes are the most important. His examination of the digital vascular system in fetuses from the age of four and one-half months to term dis-

closed complete absence of the Sucquet-Hoyer canal. (Besides using the term digital glomus, Popoff often speaks of the "Sucquet-Hoyer canals" for arteriovenous anastomoses. This term does have some descriptive value in identifying the cutaneous glomus structure.) Popoff estimates the average number of these canals per square centimeter of surface area in the big toe of a normal person 20 years of age to be: ventral surface, 18; lateral surface, 10; nail bed, 24; and nail matrix, 12. The figures he obtained from corresponding parts of the thumb were approximately the same. It will be noticed that these figures are strikingly lower than those of Grant and Bland. The latter investigators obtained their data on cadavers 24 hours after death with the method of intravascular injection of washing, fixing, and using coloring fluids. Popoff used fresh surgical material, fixed *in situ*, which revealed the state of the vascular digital system as it existed at the time of fixation.

In addition to those data which describe the relative distribution of the normal glomus bodies throughout the skin, some mention should be made of the various regions in which glomus tumors have been located. This may be of significance in view of the fact that most of the recent literature on glomus bodies has been concerned with their abnormalities, and glomus tumors have been found in some regions of the body where no one has attempted to find the normal structures.

Many data on the distribution of glomus tumors have been given in the literature of pathology. These tumors have been found chiefly in the extremities and the subungual regions of the fingers and toes. Other cases have, however, been reported from regions of the thigh, calf of the leg, knee, ankle, forearm, elbow, upper arm, and penis.

In 1939 Grauer and Burt (20) pointed out that in 40 to 50% of the tumors recorded there was a previous history of trauma and that the average duration of their presence, from the time of their appearance to the development of symptoms, was nine years. The smaller tumors reported were usually subungual, while the larger ones were found in regions where the tissue was easily distensible.

Age and Vibratory Sensitivity

Our second secondary source of evidence which supports the claim that the cutaneous glomus body functions as a receptor of cutaneous pressure and vibration centers about the well-known fact that vibratory sensitivity decreases with advanced age. As a corollary to this gradual loss of sensitivity with age, studies show that the glomus structures are often found to be absent or atrophied in elderly people. Popoff (25) states, for example, that in

persons over 60 years of age the number of digital Sucquet-Hoyer canals per square centimeter begins to decrease, and this decrease progresses with advance in age.

Vibratory Sensitivity and Peripheral Circulation

The writer has observed that sensitivity of the palmar surface of the fingers to mechanical vibration and to alternating electrical currents varies comparatively little for most normal subjects under controlled conditions of stimulation. That is, both the frequency range and the threshold for any given frequency will not vary greatly among people of appreciably the same age and among those persons with apparently normal blood circulation. However, the author has noticed that in subjects with apparently poor digital circulation the vibratory threshold at any given frequency may be as much as 10 times as high as the threshold for the "average" subject. Similarly, such subjects have a shorter range of frequency sensitivity.

Vibratory Sensitivity and Skin Temperature

Another indirect source of evidence which shows a relationship between vibratory sensitivity and the activities of the neurovascular system of the skin is shown by the work of Weitz (31). Working on limited regions of the volar and dorsal surfaces of the arm, he found that increasing the skin temperature surrounding "vibration spots" decreased the vibratory thresholds to a minimum, at which point, with further heating, the thresholds were increased. With decreasing skin temperature vibratory thresholds showed a continuous rise. These data are important from our point of view; since it is known that the glomus bodies dilate with increased temperature, to a point where constriction occurs, and contract when the regions in which they are located are cooled. Just why the vibratory thresholds are affected in the manner which Weitz has shown is a matter for speculation. However, the important thing is that changes in vibratory sensitivity do occur with temperature changes at the local regions of stimulation. It seems reasonable that some such effect should be present, since the glomus bodies function in peripheral temperature regulation.

V. THEORETICAL CONSIDERATIONS

It has been shown that cutaneous glomus bodies are not found as "isolated" structures in the same sense that one may find en-

capsulated end-organs. Many writers have mentioned variations in the size of glomus bodies and have brought out the fact that some are straight, some tortuous, and some coiled in tight, ball-like knots. Our observations agree with these statements. The compactness, the size, and the shapes of these mechanisms vary with location in the body and with the age of the individual. It is generally agreed that these structures are richly endowed with a nerve supply, apparently containing many sensory fibers as well as motor fibers. In essence, the glomus body may be pictured as a highly innervated neuromuscular unit of the vascular system surrounded by regions of less nerve concentration.

On the basis of our studies we believe the glomic unit of the neurovascular system operates in some sensory capacity in the mediation of pressure and vibration, and this accounts for "spot" sensitivity. However, spatially considered, we might better think of this as a small skin region with a peak of sensitivity surrounded by less sensitive regions. This is in harmony with observer reports when one attempts to locate "spot" sensitivity. And these experiential descriptions parallel closely the descriptive makeup of the neurovascular structures.

One might explain the difference between "light" and "heavy" pressure in terms of the intervening distance from the point of stimulation to the locale of the glomic unit. This distance may be horizontal, vertical, or both. "Heavy" pressure may result from a more adequate stimulation of the glomic unit, and "light" pressure may be experienced when this mechanism is less adequately stimulated. Or again, these differences in the degree of pressure sensitivity may in part be due to the relative sizes or shapes of the glomus bodies being stimulated. Similarly, differences in the thresholds of vibratory sensitivity might be partly accounted for on this type of spatial basis.

It has long been recognized that on some parts of the skin there exists a relationship between the location of pressure spots and hair follicles. Frequently one will find pressure-vibration spots on the "windward" sides of hairs. That one finds glomus bodies located near the base of hair follicles on the "windward" sides has been shown from some of our experimental biopsies and from punch biopsies taken from surgical specimens. For example, in one of our experimental biopsies a good pressure-vibration spot was located near the base of a hair, and this hair, when moved, elicited a good sensation of pressure. When the hair was stimu-

lated by mechanical vibration, it was found that the threshold for eliciting the sensation of vibration was low compared to the stimulation of other hairs which did not have good pressure spots near them. Upon excising this hair and the tissue containing the pressure-vibration spot near its base, a portion of a glomus body was found very near the base of the hair follicle.

In an earlier paper the writer pointed out the possibility that hairs may work as levers, in certain hairy regions of the skin, in transmitting pressure and vibration stimuli to the "appropriate receptor." The writer now believes this receptor to be the glomic unit of the neurovascular system. However, all hairs do not elicit sensations of pressure when stimulated, and this may be expected, since many hair follicles are not near glomus bodies. On hairy regions of the skin many pressure-vibration spots are found in areas some distance from hairs, and, of course, some of the hairless regions of the body, palms of hands, lips, etc., are very sensitive to pressure and vibration. Therefore, it is the contention here that the hair mechanisms do not function as primary receptors for the pressure and vibration stimulations, but act as mechanisms of a second order that help transmit the stimulations to the deeper-lying glomus bodies.

Other Possible Sensory Functions of the Neurovascular System

In the nine experimental biopsies described in Part II of this paper, it was reported that four of the excised areas were sensitive to temperature. In addition to containing pressure-vibration sensitivity, two of these four biopsies were cold sensitive and two were sensitive to warmth. A comparative examination of all of the biopsies shows that there are certain structural differences found between the tissues of those biopsies sensitive to temperature and those comparatively insensitive to temperature. The writer now has experiments under way which seem to indicate that in addition to serving in the mediation of the pressure-sensitive qualities, portions of the neurovascular system also function differentially in the mediation of temperature sensitivity. A report on these studies will be published soon.

VI. SUMMARY

Aside from such inadequately supported guesses as that Meissner corpuscles and the corpuscles of Pacini may function in the reception of pressure and vibration, little consideration has been

given to the possible pressure-vibration receptors. A review of the literature shows that the attempts that have been made to establish correlations between the various cutaneous sensory qualities and their possible receptors have, on the whole, been inconclusive.

In this paper seven direct excisions of cutaneous pressure-vibration spots and two "control" excisions of spots relatively insensitive to the pressure qualities are described. An analysis of these nine biopsies leads to the assertion that the cutaneous pressure-vibration sensations are mediated by the arteriovenous anastomoses or the glomic units of the neurovascular system of the skin. A brief history and a structural account of these mechanisms are given. Other evidences in support of the postulation that the glomus body serves as *a* receptor, if not *the* receptor, of cutaneous pressure and vibration are presented.

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THE BERNREUTER PERSONALITY INVENTORY: A REVIEW OF RESEARCH

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The Bernreuter Personality Inventory has, almost since its publication in 1931, been the most widely used and thoroughly abused instrument for diagnosing personality. Because it yielded scores first for four, now for six, personality "traits," and because the names assigned these traits have been familiar to psychologists and educators, the Inventory found a ready market and has been used by many practitioners and in many investigations.

Some of these research studies have been disappointing because they failed to find clearly significant differences between employed and unemployed, between successful and unsuccessful, between maladjusted and normal, individuals. This lack of diagnostic value in the Bernreuter was doubly disillusioning because of the recent emphasis on the importance of personality traits in academic, vocational, and social adjustment. Intelligence test scores having been shown to yield imperfect correlations with the various criteria of success, it had been repeatedly pointed out that these discrepancies between prediction and fact were due to nonintellectual, personality factors. When objectively scored inventories of personality traits became generally available, psychologists, school administrators, and vocational counselors looked to them to improve their predictions, to complete their regression equations. It was also thought that they would provide a short cut in the selection of individuals needing treatment for personality problems.

When investigations failed to yield clear-cut results or contradicted each other, when clinicians and teachers found that the test results seemed to have little relation to other factors which they observed, one heard the Inventory condemned outright by many of its users. Brotemarkle's title, "What the Bernreuter Personality Inventory does not measure" (15), reflects this attitude; so do Strang's comments: "The Bernreuter Personality Inventory within the past five years has been subjected to a storm of unfavorable comment and convincing destructive criticism" (128, p. 214).

In spite of these facts, the Personality Inventory continues to be used in both practice and research. The attached bibliography includes all but a very few known studies (which do not seem to

add anything to our knowledge of the instrument) and shows the following trends in publication: in 1932, 7 distinct published studies; 1933, 21; 1934, 19; 1935, 23; 1936, 17; 1937, 12; 1938, 18; 1939, 8; and 1940, 8. It seems that publication reached its peak in 1935, declined, rose again in 1938, and was stabilized at a somewhat lower, but still fairly high, point during the last two years.

A total of more than 135 different published studies using one psychological test is an impressive record. This, combined with the fact that the Bernreuter was the best-known test in Pallister's (96) canvass of American psychologists and is typical of the inventory approach, has made it seem especially worth while to assemble in one place the important findings concerning the Inventory and to analyze them in order to achieve a better understanding of its defects, possible values, and practical uses.

DESCRIPTION OF THE INVENTORY

Personality Inventory, by R. G. Bernreuter, Pennsylvania State College, was published by the Stanford University Press, Stanford University, California, in 1931. (\$1.75 for 25; \$3.00 for 50; \$5.50 for 100.)

Purpose. To measure six traits: neurotic tendency (B1-N), self-sufficiency (B2-S), introversion (B3-I), social dominance (B4-D), self-consciousness (F1-C), and solitariness (F2-S). B1-N, B3-I, and F1-C are practically identical. Designed for use with adolescents and adults.

Contents. Consists of 125 questions based on those in questionnaires previously constructed by Thurstone, Allport, *et al.* Answers are recorded by encircling one of three possible responses: "Yes," "No," "?" Example: "Are your feelings easily hurt?"

Administration. Self-administering, group or individual. Interpretation of items is left entirely up to examinee, except for unprejudiced explanation of unfamiliar words when found. No time limits; probable maximum required is 30 minutes.

Scoring. A separate stencil for each trait. Weights ranging from +7 to -7 are assigned to each item according to its diagnostic value as determined by the Kelley-Cowdery-Strong method. The algebraic sum of the weights on a particular key corresponding to the responses encircled by a given individual constitutes his score for that trait.

Norms. Norms are provided which enable one to convert raw scores into percentiles for male and female adults, college students,

and high school students. Several investigators agree that Bernreuter's norms are adequate (95, 98, 117, 124), although two have disagreed (99, 145).

STANDARDIZATION AND INITIAL VALIDATION

The essential data on the standardization of the Inventory are given by Bernreuter (9). The test was standardized on criterion groups which had been selected as extreme by other inventories, namely: the Thurstone, Laird, Allport, and Bernreuter's S-S scale. The 50 most extreme cases were used for each trait. The correlations of Bernreuter's four keys with the criterion tests, from which many of his items were taken, range from .67 to .94, a substantial degree of validity if the original inventories are adequate. Kuznets' (68) criticism of the Inventory's validity, based on his conclusion that many of Bernreuter's items were "evidently taken from the tests used in validating the Inventory" (a fact made clear by Bernreuter), is beside the point. What is important is that, if the other tests are valid, this one probably is also.

Reliability

Four studies report reliability coefficients calculated by the split-half technique. Bernreuter (9) found that they ranged, when corrected, from .83 to .88 for the different scales, the mean being .86. Stagner (117) reported similar figures, ranging from .67 to .79 and correcting to .80 to .88. Frank's (49) data agree with the above, the range being from .77 to .86. Dudycha (36) reported coefficients ranging from .83 to .88.

Frank (49) also obtained retest coefficients, based on 35 cases, ranging from .77 to .86. Bills and Ward (13) reported retest reliabilities after one year on a sales job ranging from .65 to .72. Paterson (98) reported similar figures, the lowest being .70 and the highest .87. Lentz (75) found retest reliabilities ranging from .90 to .92. As several of the above have pointed out, these are high enough for use with groups, but suggest that caution is necessary with individuals.

Farnsworth (42) has studied the stability of Bernreuter scores over a longer period. He tested 319 Stanford freshmen, retesting at intervals of one, two, and three years. He found no significant changes on any of the six scales, although the coefficients decreased slightly with time, a change which he attributes to cultural factors rather than to the test. Coefficients after one year ranged from .70 to .77; after two years, .56 to .74; after three years, .44 to .72. After one year 71.45% of the items were answered in the same manner; after two years, 65.45%; after three years, 64.91%. These figures compare not too unfavorably with the retest coefficients of intelligence tests. Lentz found that, although about 20% of the reactions to specific items changed on a retest, 81% of these changes neutralized each other; having little effect (75). The pattern of response was reliable.

It has occasionally been claimed that supposedly significant scores could be made by checking items on the Inventory in a chance manner. Burnham and Crawford (18) threw dice in order to check this claim and found that scores tended to group between the 50th and 90th percentiles: the dice, in other words, tended to be slightly maladjusted. Bernreuter, on the other hand, has twice reported contrary findings after card-shuffling and a comparison with genuine scores (10, 12). In one study, for instance, he compared the dispersion of chance scores with that of actual scores made by college students and found them to be so different that he concluded the latter must reflect genuine factors in the individuals (12).

Validity

Items. The validity of the items in the Inventory has been considered by Bernreuter and by the authors of the tests on which his is based. Items were chosen on logical grounds, because they described types of behavior known to have certain psychological significance in clinical studies. They were validated by the method of internal consistency—that is, by the degree to which each item agreed with the general trend of the items. A study of the items important in his B3-I scale, for instance, led Bernreuter to the conclusion that it measured autistic thinking, introspection, and other types of behavior typical of introversion in its abnormal manifestations (9).

Landis and others have criticized this method of selecting items on the grounds that it is logical, not psychological (71). In one study he and Katz (70) reported that roughly three-fourths of the self-descriptive items, as checked by neurotics, agree with the objectively determined facts. In a subsequent study, however, he and others (71) made an item analysis of the Inventory to discover whether abnormals actually differ from normals in their responses. Contrary to logical expectation, they found that more normals than abnormals reported a tendency to daydream, to cross streets in order to avoid meeting people, to have ideas run through their heads, etc. Apparently these truly neurotic symptoms are incorrectly reported by the neurotics, and normal persons believe they have them when they do not, relatively speaking. Thus, the logical approach breaks down, and an empirical approach yields unexpected results. Mosier (91) has elaborated on this topic.

Revising the scoring method on this empirical basis, Landis and his colleagues found that abnormal persons were differentiated from normals (71). This raises another question concerning methods of validating such inventories: Should they be so constructed

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as to distinguish abnormal from normal individuals, rather than normal individuals with abnormal tendencies from those who are well adjusted? If it is assumed that normals and abnormals are, in fact, on a single continuum, the question may seem irrelevant, for a test capable of doing one should automatically do the other. At the same time, it should be clear that the very existence of a severe maladjustment may render an abnormal person incapable of responding to inventory items in the same manner as a more or less normal person. This would account for the unexpected answers which Landis found to some of the Bernreuter items and suggests the possibility that normal, well-adjusted individuals may respond in agreement with logical expectation, that normal but poorly adjusted persons may respond in the manner expected of neurotics, and that abnormal persons may respond in a manner contrary to logical expectation to some items, for compensatory reasons. This hypothesis seems plausible in the light of known facts and should be worth checking; it means, in effect, using two different types of "abnormal" groups. If it is correct, Landis' empirical approach would be as misleading with normal individuals as Bernreuter's logical method is with psychotics, at least in the case of some items. That this is so is suggested by the apparent failure of the Neymann-Kohlstedt inventory, standardized on abnormal cases, to be superior to the Bernreuter.

Abnormal Subjects. Apart from the validity of the weights given certain items in the Inventory there exists a broader question, namely: the ability of the test as a whole to distinguish normal from psychotic and neurotic individuals. We have seen that the empirical scoring method of Landis and associates did do this; will Bernreuter's logical methods do so too, in spite of defects in some details?

Marshall (79) was the first to publish data bearing on this question. She gave the Inventory to 371 patients, 106 of whom were neurotics and the balance various types of psychotics. She reported that 50% of the neurotics were more neurotic and more self-sufficient than 80% of the normal population, 20% of the men and 10% of the women making higher scores than any subjects in Bernreuter's normal groups. Of the epileptics, 70% were less self-sufficient and less dominant than 50% of the general population. Of the schizophrenics, 80% of the autistic males and 60% of the autistic females exceeded the 50th percentile, and the paranoids were all below the 50th percentile in neurotic tendency. The

manics were all below the 50th percentile in introversion, and the depressed cases were above the 80th percentile. Addicts and behavior problems resembled normal individuals.

Yu (147) administered the Inventory to 127 schizophrenics and 34 manic-depressives and found the former more introverted, neurotic, and submissive. The differences were not sufficiently clear-cut, however, for differential diagnosis.

Landis and Katz (70) reported on the use of the Bernreuter with two different groups of subjects. The first consisted of 184 house patients and 40 out-patients, all coöperating voluntarily. Blanks were scored for neurotic tendency. Of the neurotics in this group, 38% scored between the 90th and 100th percentiles, 65% being above the 70th. Among the schizophrenics, 23% were above the 90th percentile, and 48% above the 70th. No manics were above the 50th percentile, and 20% and 48% of the depressed cases were above the 90th and 70th percentiles, respectively. These findings are in general agreement with Marshall and with Yu. In the second phase, however, which is not reported in detail, the picture is not quite the same. This time 250 different individuals were tested. The 18 scoring highest on B1-N were selected, together with the 18 scoring lowest: 9 of the former group were found to be normal and 9 neurotic, while 6 of the latter group were normal and 12 were neurotic. Landis' and Katz' comments on this material are rather glum, but, apparently partly on the basis of unreported data, they summarize by saying that high scores on B1-N are indicative of neurotic tendency, while low scores do not necessarily mean that those individuals are not neurotic. Thus the Inventory does appear to have discriminating value, as reported in three independent studies.

A fourth study dealt with this same topic. In it, Landis, Zubin, and Katz (71) reported on 125 normals, 28 neurotics, and 97 psychotics. None of the abnormal groups was differentiated from any other, and the critical ratios of abnormals and normals on the B1-N, B2-S, and B4-D scales were .57, 3.14, and 1.49, respectively. This study cannot be directly compared with the preceding without a reworking of the data, but it is clear that in this case B1-N is of no value in distinguishing normal from abnormal persons, whereas in the others it was. Several possible reasons suggest themselves. The first two studies differentiated between neurotics and psychotics of various types when classified and contrasted with normals, whereas this last study lumps the abnormals together.

As the earlier studies showed differences in different abnormalities, according to logical expectancy, it is difficult to justify this lumping procedure. Secondly, the numbers in the earlier studies, especially Marshall's, are larger. Thirdly, the comparisons of distributions are more likely to reveal trends than the critical ratios, important though these latter are in determining their significance.

Farnsworth and Ferguson (43) have reported some of the details of a case of suicide, a superior, "normal" student whose scores one year, and again one year later (three months before suicide), are given below:

	Percentiles	
	First Test	Retest Before Suicide
B1-N	50	83
B2-S	85	87
B3-I	43	78
B4-D	33	25
F1-C	33	77
F2-S	88	98

As the authors point out, the shift toward the unwholesome extremes is clear-cut in all but self-sufficiency (B2-S). They suggest that periodical retests, in order to detect trends indicative of a need for therapy, should be valuable.

Hathaway (56) reported on nine psychopathic inferiors, all of whom were either in the "best" 10% of the B1-N scale or off-scale entirely. He suggests, therefore, a possible diagnostic significance of so-called extremely stable scores: those nearer the average would accordingly be the most desirable. A new scale for psychopathic inferiority is being developed, based on this and on the Humm-Wadsworth.

Brown (16) found that, contrary to clinical expectation, drug addicts were not differentiated from normals by their introversion scores. Paterson and associates (98) reported from a clinical check that the test tended to select neurotics and psychotics, but missed many maladjusted cases who made "good" scores.

In summing up these studies, it seems necessary to disagree with the final verdict of Landis and his associates. When the data are examined in detail, they do appear to reveal differences between normal and various groups of abnormal individuals, even though these differences are not so clear-cut as one would wish. As Landis himself wrote after his earlier study, unfavorable scores do tend to have significance, although favorable scores are not necessarily a sign of good adjustment. Hathaway's study suggests the desirability of scores near the mean.

Behavior Problems. Six studies consider the value of the Bernreuter in predicting problem behavior.

Marshall's (79), already mentioned, failed to find any differences between hospitalized behavior-problem cases and normal individuals. Speer (114) compared 58 problem children at the Mooseheart Laboratory with 184 controls, using all four B scales. He found no significant differences. Keys and Guilford (67) administered the Bernreuter and a number of other inventories to 261 ninth- and tenth-grade boys and correlated these with Haggerty-Olson-Wickman ratings. The coefficients for B1-N, B2-S, and B4-D equaled $-.04$, $.07$, and $.15$, respectively, the last being reliable. Nottingham (94) found no personality differences in unmarried mothers. Mathews (80), however, found that his "good behavior" group was significantly lower on F2-S than his "poor behavior" group. Horsch and Davis (59) found that penitentiary inmates were more neurotic and introverted than those in reformatories and than normal individuals.

From these studies we may conclude that, whatever the traits the Bernreuter is measuring, and however adequately it may measure them, the Inventory is of little practical value in selecting behavior-problem cases, although they do seem to indicate that persons with certain types of personality patterns are more apt to develop some types of problem behavior than are others. Clear-cut differentiation is unlikely because of the complexity of both personalities and the situations in which they are found.

Personnel Problems. College students who were poor readers, who came voluntarily for personal help, or who were enrolled in mental hygiene courses, were tested by Stogdill and Thomas (124), the total group numbering 413. Taken as a whole, the distribution was similar to that of the norms. When classified, the voluntary cases were the most neurotic, followed by the poor readers, according to logical expectation.

St. Clair and Seegers (123) tested 729 men and 433 women freshmen at Temple University. The scores of those who were expected to deviate, on the basis of a questionnaire filled out by all, were tabulated and were consistently above the 50th percentile in neurotic tendency. Those requesting interviews concerning problems of family relations made a mean rating on B1-N at the 73rd percentile; those wanting interviews concerning financial problems, to cite just one other case, ranked at the 51st percentile. Those who were earning part of their expenses were more self-sufficient, and the leaders in college activities made better balanced scores in all areas. In another study, the same authors (122) analyzed the F scales developed by Flanagan (47) for Bernreuter's Inventory. Here they report that the picture given by the whole profile is more significant than the score on any one scale. Two types of profiles are described, one indicative of a withdrawing personality, the other of leadership. The former profile is high in neurotic tendency, low in dominance, and higher in self-sufficiency; the latter profile is low in neurotic tendency, high in self-sufficiency, dominance, and solitariness. Farnsworth (41) has called attention to three modal profiles, the most common being: lowest third of B1-N, highest B2-S, lowest B3-I, and highest B4-D.

Bloom (14) related Bernreuter scores to personal data for 243 students. Extracurricular activity had no relationship to any of the scales, but fraternity members were more stable, dependent, and dominant than others. Earners were self-sufficient and dominant. High B1-N students did not think of themselves as more nervous than others, but they indicated that they worried more. Submissive students had more ailments than others. Hunter and Jordan (60) found leaders more self-sufficient, more dominant, than other students.

Jarvie and Johns (61) obtained ratings from faculty members who knew students intimately and found correlations ranging between $-.15$ and $.14$. Other data led them to conclude that the Inventory was of no value in student counseling at the Rochester Mechanics Institute. Johnson (62), on the other hand, felt that it had constructive value in counseling work as one part of the clinical picture, as did Anderson (4), whose study is referred to in connection with occupations, and a number of members of the New College (Teachers College, Columbia University) faculty (104).

Fisher and Hayes (46) compared the results of Bernreuter scores given to entering women freshmen with psychiatric diagnoses made as a result of referral by instructors for suspected serious maladjustment. Significant and reliable relationships were found between serious maladjustments and high scores on all traits but dominance.

Coiner (27) administered the Bernreuter to college students and compared the scores of cheaters with those of noncheaters. She reported that "cribbers" were more neurotic, less self-sufficient, and more introverted. Those who did not admit they cheated varied more from the normal than did those who admitted it. A study of Campbell's (21), involving 173 students, agrees on self-sufficiency and is less clear-cut elsewhere.

Attitudes. McMurry (82) administered the Bernreuter Inventory to 196 bank employees, who also filled out a job satisfaction questionnaire and were rated for efficiency. The neurotic scale was found to have a low negative correlation with efficiency ratings and with poor work attitudes. It added nothing to Otis scores in correlations with efficiency. McMurry interprets this as indicating that personal maladjustment is generally overemphasized as a cause of vocational dissatisfaction.

Dexter (31) correlated Lentz radicalism scores with Bernreuter's scales and found unreliable r 's ranging from $-.045$ (B1-N) to $.227$ (B4-D). A multiple coefficient of correlation of radicalism with self-sufficiency (B2-S), low speed (Downey), and a 400-item information test equaled $.864$. Radical college women had good personalities, although the correlations were low.

Symington (133) used the test in a study of religious liberalism and found no relationship between Bernreuter scores and liberalism. An analysis of the items, however, showed that there was a relationship between the self-sufficient-introvert type of item and liberalism, when these were separated from the more purely neurotic type of items. The discussion of traits, below, takes up this question of the purity of Bernreuter's traits; it need only be said here that the difference found by Symington appears to agree with other findings. This being the case, the impurity of the trait

has probably hidden genuine group differences in religious attitudes and adjustments.

✓ *Marital Happiness.* Johnson and Terman (64) found the happily married more stable and extraverted, while divorced women were self-sufficient and dominant. Bernard's (7) findings agree and also show that neuroticism in the wife makes for unhappiness in the husband.

Family Resemblance and Friends. Terman (135) used the Bernreuter as one of the instruments in his study of marital happiness. While the coefficients for traits among couples were low, they were also consistently positive. In the unhappy group they ranged from .121 to .289, in the happy group from .074 to .241, for the various scales. Two of the "unhappy" coefficients and one of the "happy" were reliable. Apparently, married couples do tend slightly to resemble each other in the traits measured by Bernreuter, a finding in accord with other data of Terman's.

Other studies tend to agree with that of Terman and his associates. Sward and Friedman (131) found a coefficient of .34 for Jewish couples and of .12 for non-Jewish (56 couples each). Crook (29), studying 79 couples, found coefficients ranging from $-.05$ to $.06$. Hoffeditz (57), with 100 couples, reports a low positive relationship. Kelly (66), testing 300 engaged couples, found no significant relationships. Richardson (106) has summarized eight such studies, using various inventories, and found that the coefficients ranged from $-.05$ to $.34$, with a mean of $.14$. The Bernreuter agrees, then, with other inventories on this matter in finding low positive correlations. Van Dyne (139) found girl friends similar to each other only in dominance and sociability.

Hoffeditz (57) also considered other members of the family. All the relationships were low, the highest and lowest being those one would expect on psychoanalytic grounds: mother-daughter equaled $.267$ and $.284$ on B1-N and B4-D, respectively; mother-son, $.024$ and $.053$ for the same scales. Carter (23) studied 133 sets of twins and found that monozygotic twins were more similar in B1-N, B2-S, and B4-D than are others; that like-sex fraternal twins were more similar than unlike-sex twins in B3-I but less so in B1-N and B4-D, and that they had a negative coefficient for B2-S. The data for the identical twins are what one would expect, but the scores on all but B3-I are difficult to explain for the nonidentical twins. On the whole, however, the data on family resemblances seem to indicate a moderate degree of validity in the Inventory.

Family Constellation. Eisenberg (39) used the Bernreuter in a study of factors relating to feelings of dominance among persons of college age. He found that oldest and only children were more dominant than others. Meenes (84) found that youngest children were more dominant, self-sufficient, and less neurotic than others. Abernethy (1) found oldest children more dominant, less neurotic, than others; middlers less well adjusted than eldest children; and only children inconsistently more self-sufficient, dominant, and less unstable. Campbell (20), Stagner and Katzoff (120), and

Witty (143) found little relationship between birth order and Bernreuter scores. The first two found only children more self-sufficient; Campbell found them more unstable; Stagner and Katzoff's older children of two were more stable than the youngest of several. The latter agree that birth order in itself is meaningless, other elements in the constellation being more important. Stagner (119) made a study directly concerned with the effect of the role of parents in personality development. His findings were in general agreement with Freudian theory, the males who preferred their mothers being less stable than those with father preferences. Stagner refers this instability to the social norm of father identification.

Social Groups. A number of differing types of social groups have been compared by means of the Bernreuter scales. Occupational, including unemployed, groups will be dealt with in the next section. Hargan (54) studied a group of convicts and found that they were highly extraverted. This would seem to agree with Hathaway's data on psychopathic inferiority, previously mentioned, and with theory in that the offender against society would be one sufficiently extraverted to become actively aggressive rather than seek escape in withdrawal. Horsch and Davis (59), however, found penitentiary inmates more neurotic and introverted than the norm. That this finding suggests possible schizoid-paranoid trends may indicate the need to consider more adequately the type of crime and the situation leading to it. Different personalities may commit similar crimes because of different situations.

Shen (113) compared Chinese and American students and found the former more introverted, less self-sufficient, and less dominant. He attributed these tendencies to a greater emphasis on modesty in Chinese than in American culture. Farnsworth (42) reported that foreign students were less dominant than Americans in their earlier years in this country and became increasingly dominant with longer residence. Jewish students were more dominant than the norm. Sward and Friedman (132) compared 625 adult Jews with an equal number of non-Jews and found that 60% of the Jews exceeded the average Gentile in instability. Eisenberg (39) also found Jews more dominant, as were the children of men in business and the professions and children in private schools.

Negro-white differences have been studied by Meenes (84), Eagleson (37), and Patrick (99). On B1-N negroes were found to make lower scores than whites (99); on B2-S, higher (37, 84, 99); on B3-I, lower (84, 99) and no difference (37); on B4-D, higher (37, 84, 99); on F1-C, lower (84) and possibly higher (37); on

F2-S, higher (37, 84). There is, thus, substantial agreement on this type of comparison.

The above data indicating cultural differences in personality agree with clinical material and logical expectation, and can be taken as indicating the validity of the Inventory in studies of this type. Stagner summarizes a study of parental roles in personality development thus: "The tendency is for children reared in homes conforming to the American scheme to grow up into personalities conforming to the American standard . . ." (116).

Two other studies probably belong in this category, although they deal with a physical handicap. Welles (141) administered the Bernreuter Personality Inventory to hard-of-hearing, urban adults and to matched-hearing adults. The hard-of-hearing were less stable and extraverted and less dominant than the hearing controls, and the lip-readers were more stable than the non-lip-readers. The conclusion was that the better the contact with the environment, the more stable the individual. This agrees with the Bernreuter findings concerning foreign groups and with clinical knowledge and theory. Pintner (103) duplicated the study with small-town and rural adults, obtaining similar results and finding his isolated, hypacusic group less stable than Welles' urban group.

Occupational Groups. Persons employed in different occupations have been compared by means of the Bernreuter in several studies. The first of these was by Paterson, Trabue, and their associates at the Minnesota Employment Stabilization Research Institute (98). They reported that only dominance-submission differentiates occupational groups; salespeople were more dominant than those in unskilled, semiskilled, and skilled occupations; policemen were more dominant and also more stable and extraverted than others. The variation within groups was larger than that between groups. Dodge (33, 34) reported results which are essentially the same, with, however, no relationship between B scores and success. Salespeople were more dominant than clerical workers; traveling salesmen more so than bookkeepers; the critical ratios (D/P.E._{diff.}) equaled 5.9 and 9.1. No other scales revealed significant differences. Morton made a similar study in Montreal (89). He reported that stability was greatest in accountants, salesmen, carpenters, and electricians, and lowest in engineers and the unskilled. The mechanics and carpenters were least self-sufficient, the accountants and salesmen most so. These last were also the

most dominant along with professional men and executives, the engineers, semiskilled, and unskilled being most submissive. Super (130) found a low positive correlation between neurotic tendency and mechanical aptitude. These several studies appear to be in rather close agreement in finding the dominance scale most useful and in finding few group differences very great.

Bills and Ward (13) have reported a preliminary study of casualty insurance salesmen. Those succeeding in this work made more normal scores than those who failed in it. A study by Schultz (112) is in agreement with the above as to the value of the Inventory in selecting salesmen.

Anderson (4) made a clinical study of 40 Y.W.C.A. secretaries released during the depression. At least 70% of the group exceeded 80% of the general population in emotional stability, extraversion, self-sufficiency, and dominance. The exceptions were justified, in the clinician's opinion, by case data: they were less successful than the majority. She concluded that, properly interpreted, the Inventory does add to the counselor's insight.

In a study of 48 student nurses by Rhinehart (105), this group was found to exceed college women in instability and to make lower scores on self-sufficiency and dominance.

Motion-picture writers were studied by Metfessel (86) and were found to have traits comparable to those of the general population. It should, perhaps, be pointed out that the mean percentiles (males) of 69, 46, 63, and 33 do not conform to the modal profile noted by Farnsworth and previously mentioned, suggesting that this group does, in spite of considerable individual differences, differ somewhat from the average. Miller (88) found no relationships between the B scales and dramatic success. Carroll (22) correlated Bernreuter scores with ratings of artistic talent, Meier-Seashore, and McAdory Art Tests for 218 college students, obtaining low and unreliable coefficients, but finding a slight tendency for art talent to accompany introversion. Ratings for creative ability had a low positive relationship with neurotic tendency. Ability to appreciate and create art were not related to B1-N, B3-I, or B4-D.

✓ Unemployed and employed workers have also been compared. Paterson and his associates, in the above-mentioned study (98), found no significant differences. Morton (89) found differences which were probably significant, the employed being more stable, more self-sufficient, and more dominant. Christensen (26) found

that employed men and college men were significantly more dominant than unemployed and that college men were more self-sufficient. The same differentiation was found for women on the dominance scale. The bulk of the evidence seems to agree with Morton's conclusion that the Inventory is valid for determining group trends in personality in the occupational field, although not for individual use.

Four studies have been published concerning Bernreuter scores and success in teaching. Cahoon (19) and Sandiford (110) found no significant differences between good and poor student teachers (as rated) on any scale. An item analysis, however, revealed 18 items yielding marked differences. Laycock (74) made a similar study somewhat later with four or more ratings based on practice teaching. None of the critical ratios were significant, but a comparison of the extreme quartiles did reveal great differences on all four B scales. Laycock concluded that the technique was a promising one. Palmer (97) reported that B1-N, B3-I, and B4-D distinguished the most successful from the least successful teachers of physical education, B2-S being doubtful. Differences were in favor of the successful teachers.

High school seniors interested in teaching were studied by Yeager (145). A control group larger than Bernreuter's high school group was found to average at about Bernreuter's 75th percentile on B1-N and closer to the 50th on the other keys. Because of this discrepancy, Yeager used the "general group," his controls, as norms (boys, $N=269$; girls, $N=231$). Those interested in teaching were, accordingly, close to the average on the three keys used, the means ranging from the 52nd percentile to the 54.9th percentile. According to the published norms, however, this would make them rather maladjusted, somewhat about the 75th percentile. Yeager is probably right in comparing them to other students in their own environment; but this leads one to wonder, in view of the general agreement with Bernreuter's norms, what sort of environment this was. Phillips and Greene (101) found that unmarried teachers were slightly more neurotic than married teachers.

Pintner (102) tested a class in mental testing, finding that those whose protocols and other data caused them to be rated as poor testers were more neurotic than successful examiners.

McMurry (82) used the Bernreuter in a study of bank employees, scoring it only for B1-N. A slight negative correlation with efficiency ratings was found, but the Bernreuter scores added

little to the predictive value of the Otis test in selection. McMurry concluded that personal maladjustment is overrated as a cause of vocational maladjustment.

Physiological Factors. Omwake and her associates (95) correlated Bernreuter scores with various physiological measurements of 92 college women. The coefficients ranged from $-.306$ (B2-S and pulse) to $.161$ (B2-S and basal metabolic rate). Goldstein (52) and Stone and Barker (126) reported low correlations with biochemical tests. Morton (90) calculated correlations with morphological indices and failed to find any linear relationships. These findings seem to agree with others concerning physique and personality.

Stone and Barker (126, 127) compared premenarcheal and postmenarcheal girls by means of the Pressey Interest-Attitudes, Bernreuter, and Sullivan scales and found that the Bernreuter did not distinguish one group from the other, although the others did, and was not related to menarcheal age. As the tests measure different things, this fact is not significant, but it may be significant that the personality differences commonly supposed to result from pubescence are not reflected in the Bernreuter. In view of the general failure to find such differences associated with pubescence, this can hardly be taken as a reflection on the test. Dispensa (32) correlated Bernreuter and thyroid tests and reported a negative relationship between hyperthyroidism and neuroticism.

Age. Age differences have not been frequently studied. Bernreuter's norms show age differences too slight to be emphasized (9). Carter (23) and Miles (87) found no relationship between B scores and age, but Horsch and Davis (59) reported that self-sufficiency and dominance increased with age in criminals and in the general population.

Intelligence. Bernreuter (10), Carter (23), Brotemarkle (15), Finch and Nemzek (45), and Omwake, *et al.* (95) reported negligible correlations between the Bernreuter scales and intelligence. Greene and Staton (53) found only one significant correlation, $-.33$, between F2-S and the Ohio State test. Stagner (116) has reviewed other studies and reported negligible correlations between B scores and intelligence. Hollingworth and Rust (58), studying a group of adolescents with IQ's ranging from 135 to 190 (median 153), found this group more stable, self-sufficient, and dominant than the controls. Wrenn (144) reported that the very superior student was no more stable, but more self-sufficient and dominant, than the inferior student. This apparent difference is probably explainable on the basis of differences in methods, as comparisons involving extreme groups frequently reveal differences not shown in correlational studies. It seems quite possible that very bright children may tend to have good personali-

ties without the relationship in average groups being close enough to show up in correlational studies. Indeed, this agrees with clinical evidence and other studies. St. Clair (121) has calculated the biserial coefficient of correlation between intelligence test scores and his "Profile I," withdrawing personality (B1-N, over 70; B4-D, below 30; B2-S, 25 points above B4-D), and found it equal to .40, indicating real promise in this global approach.

✓ *Achievement.* Relationships between Bernreuter scores and school achievement have also been studied, as it was hoped that personality inventories would raise predictions of academic success. The correlational approach has yielded more or less consistently neutral results, as shown by Brotemarkle (15), Finch and Nemzek (45), Nemzek (93), Omwake, *et al.* (95), Engle (40), Greene and Staton (53), and Stagner (116). Nemzek also compared extreme cases and still found the test of no differentiating value, but Greene and Staton and Stagner found low achievers less self-sufficient than others. Neel and Mathews (92) found that high-achieving superior students were more introverted, self-sufficient, and solitary than nonachieving superior students. Although these findings do not agree with those reported in early studies, they do agree with later findings with other inventories. The traits measured by personality inventories do not have any direct bearing on success in school and college, although low correlations in the 20's are occasionally reported (128). As Stagner concluded (116), personality affects achievement by influencing the use made of one's abilities and, therefore, does not yield a linear correlation with achievement. It is, however, related to study habits, B1-N, B3-I, and F1-C correlating $-.32$, $-.41$, and $-.41$ with Wrenn's Study Habits Inventory (144).

Ratings and Case Studies. The self-sufficiency scale was the first developed by Bernreuter (8). This was correlated with ratings by associates, the coefficient being .54. Bernreuter also correlated the B scores with self-ratings which had a low reliability and found relationships expressed by coefficients ranging from .56 to .67. Casselberry (25) obtained a correlation of .52 with self-ratings of social adjustment. With ratings by others, the coefficient was $-.47$. Roberts and Fisher (107) reported a coefficient of $.32 \pm .10$ for B3-I and ratings based on half-hour interviews. Burks (17) had college freshmen women rated by eight hall officers and others in a position to know them. The correlations were .21, .15, and .43 for B1-N, B4-D, and B2-S, respectively. Four out of five girls above the 90th percentile in self-sufficiency were recognized as

such by all eight raters. Where discrepancies occurred, individual analysis revealed adequate reasons.

Stagner (116) tested 230 freshmen at the University of Wisconsin, over 100 of whom called (by invitation) to get their scores. These were interpreted by Stagner, the students commenting. The investigator took notes, rating the men on the basis of the interviews. B1-N was found to have a high degree of validity, scores above the 90th percentile indicating maladjustment and low scores meaning good adjustment. B2-S was also found valid, high scores indicating intellectual independence. B3-I resembled B1-N. B4-D was found fairly valid. Turney and Collins (138) found a close agreement between Bernreuter scores and diagnoses of normal high school students based on case studies.

Objective Tests. The relationship of B3-I scores to results of a mirror-tracing test was studied by Roberts and Fisher (107). The coefficient was $-.25 \pm .11$. Mirror-tracing, correlated with judges' rating of extraversion (described above), yielded a coefficient of $.915 \pm .02$. Ryans (109) administered Bernreuter inventories and persistence tests to 40 college sophomores and found persistence positively related to stability, extraversion, and self-sufficiency.

Suggestibility has been correlated with Bernreuter scores by Bartlett (5) and by Messer (85), using Hull's test. No relationships were found. Classifying his subjects (52 normal and abnormal individuals), Bartlett found relationships between suggestibility and submission in psychoneurotic and between suggestibility and extraversion in normal persons. The numbers, however, were small, with a total group of 52.

The Kent-Rosanoff Association Test was used by Laslett and Bennett (73), who found no relationship between it and B1-N scores, and who concluded that they either measure different things or measure them in different ways. Rorschach Inkblot scores for 52 college students were analyzed by Vaughn and Krug (140). Affective stability and neurotic tendency were correlated to the extent of $-.52$; introversiveness and introversion, $.78$. In view of the complete lack of similarity in testing techniques, these correlations, if confirmed by other investigations, constitute important evidence of the validity of pattern scores based on subjective responses. Partial confirmation is to be found in the common factor of emotional stability in both tests reported by Line and associates (76).

Local information ("gossip test") and Bernreuter scores (B3-I) were correlated by Davis and Rulon (30), who concluded that the former, because it was not related to B3-I scores, was not a valid test of introversion. We cannot draw conclusions concerning the validity of the Bernreuter Inventory, in which we are interested, as it was correlated with a test of unknown significance. Dudycha (36) found stability and self-sufficiency related to punctuality. Phillips and Greene (101) found a correlation of $.77$ between B1-N and Bell total adjustment scores. Adams (2) studied experimentally induced frustration in 450 college freshmen.

Those diagnosed as neurotic by the Bernreuter differed neither in efficiency of performance nor in susceptibility to frustration. They did, however, display more agitated behavior and gave more alibis for failures. The first findings were presumably due to a frustrating situation not sufficiently important to disorganize behavior in anyone.

Effect of Experience. Rose (108) compared pretests and retests of 291 speech students and 291 paired students in nine colleges. The experimental (speech) group showed a greater decrease in neurotic tendency, a greater increase in dominance, but no differences in self-sufficiency and sociability. Turney and Collins (138) found that 21 high school students of psychology, who did not study personality measurement, showed significant improvement on all keys over their controls. These findings are in accord with the experimental studies of the modification of personality, but it seems likely that test sophistication has affected the Turner-Collins study despite their attempt to control it.

Effect of Mood and Rapport. The Inventory has frequently been criticized as a self-rating technique, subject to all the weaknesses and defects of self-ratings. Few attempts have been made to check the validity of these criticisms. Bernreuter (10) reported that scores on his Inventory were not affected to any appreciable degree either by the desire to do well or by a desire for social approval, as evidenced by a comparison of standard situation scores with retest scores after instructions were given to answer (a) "as you would like to be," and (b) "as you think you ought to be." Landis and Katz (70) found that most of the self-descriptive statements of neurotics taking the Inventory were true when objectively verified. Johnson (63) worked with a group of 15 college women in carefully controlled conditions, getting them to take the Inventory when in subnormal and supranormal moods. None of the critical ratios was clearly significant, the range being from -2.3 to 1.1 . They were, however, in the expected directions, low mood being accompanied by shifts toward neuroticism, dependence, and submission. The lack of significance is attributed to a fixing of responses the first time the test is taken. Whatever the reasons, it is clear that responses to Bernreuter items are relatively stable and unaffected by mood and other factors. No one has tried to get shifts in predetermined directions, as has been done with Strong's Vocational Interest Blank, but, as those changes were obtained as the result of conscious effort obtained by rapport with the examiner, such a test is not so important for practical purposes as those already applied

to the Bernreuter. Hartmann (55) found that courses in educational psychology produced what may have been significant differences (98/100) in B1-N scores, which suggests that test sophistication may affect self-report. Metfessel (86) compared unsigned Bernreuter tests for 139 unselected adults with the norms and found that the former portrayed themselves as rather more neurotic, introverted, and submissive. This agrees with Spencer's (115) thesis to the effect that signing one's name does cause one to improve one's score. When a personality inventory is to be identifiable, rapport must clearly be the best possible. Lorge (78) reported individual tendencies to check largely "yes," "no," or "?" responses to the exclusion of others. The effect on scores was not shown.

THE TRAITS MEASURED

Bernreuter developed four scales for the scoring of his Inventory, each of them purporting to measure a different trait (9). Two others, found to underlie these four, were published by Flanagan (47), and a seventh has been described by Schlaudeman (111). This last, however, was found to correlate highly with B1-N, B3-I, and F1-C. The intercorrelations of the other scales have been calculated by various workers, Bernreuter (9), Brotemarkle (15), and Stagner (117), to cite just three investigators, agreeing that B1-N and B3-I measure practically the same thing and that these have a rather high negative relationship with B4-D. Thus, only B1-N and B2-S, and possibly B4-D, of the Bernreuter scales, can be said to measure independent traits. Flanagan's factor analysis and the two resulting F scales (47) fit in with this correlational analysis, showing that two underlying factors account for the three or four apparent traits measured by the B scales. Also in agreement is Bernreuter's study (11), which reports finding an "emotional" factor underlying all of a group of personality inventories, plus a group factor in B1-N and B3-I. Perry (100) found emotional, sufficiency, and dominance factors in 10 personality tests. Line and associates (76) reported a common "stability" factor in the Bernreuter and the Rorschach tests.

Numerous studies have been made with this and other inventories in order to determine just which traits, if any, were being measured, and the subject is still a debatable one. Vaughn and Krug's study (140) suggests that the Bernreuter scales are measuring a real psychological entity and not just a statistical artifact, as

asserted by Lorge (77). The last-named investigator correlated the "yes," "no," and "?" responses, finding that they ranged from $-.78$ to $.72$, most of the coefficients being low. This led him to conclude that they were not measuring the same trait, especially as some intertrait correlations were higher than those within certain traits. Flanagan (48) criticized Lorge's conclusions, contending that low correlations between parts of a test do not invalidate the scale as a whole and have been considered acceptable in other tests. In addition to this fact, it should be kept in mind that some of the traits that Lorge was analyzing were related as wholes (B1-N and B3-I, for instance), and, therefore, it is to be expected that some parts would correlate more highly with parts of other traits than with parts of the same trait. Lorge condemned the Bernreuter outright, but on further investigation concluded that Flanagan's keys were both independent and consistent and, therefore, usable (77).

In practice, the three relatively independent Bernreuter keys continue to be used, either with or without the statistically superior Flanagan keys. The reason for this probably lies in the fact that the B scales appear to have greater psychological significance. We are used to thinking of emotional stability and of the other traits measured by the B scales, while the concepts of self-consciousness and solitariness, however familiar generally, have not been long current in psychometrics and have less clinical reality. If Flanagan had called his F1-C scale "emotional stability" or "extraversion" instead of "self-confidence," duplication of Bernreuter's names notwithstanding, the F scales might be more widely used!

The emphasis in this discussion has attempted to be consistently empirical. Before attempting to conclude, however, with a summary statement of what the Bernreuter can measure, it seems advisable to describe the psychological traits measured by the seven existing keys to the Bernreuter Inventory. The correlational studies make this also a somewhat empirical question. For a more complete and theoretical discussion, the reader must be referred to the recent books by Allport (3) and Stagner (118, Chap. 8). The latter has concluded that there are three "major traits of personality," corresponding to Bernreuter's emotional stability (sensitivity), self-confidence, and sociability scales.

B1-N appears to measure, more than anything else, emotional stability or sensitivity. A low score indicates a wholesome adjustment to the environment—what is often called extraversion be-

cause it involves the ability to face facts objectively and deal with them without internal conflict. High scores indicate a poor adjustment to the environment—what might be called unwholesome introversion, in which the individual tends to withdraw from contact with the outside world because of maladjustment in it. "Emotionality," although common in neurotics, is not exactly synonymous with "neurotic tendency."

B2-S probably measures the other type of introversion, at one extreme, and a type of extraversion not commonly thought of as such, at the other. The high-scoring person is "self-sufficient," is not dependent on others for advice and companionship, and is able to get along on his own with little difficulty. He is not "withdrawn," so much as free from the need to advance. He is an introvert in the original Jungian sense. The low-scoring person is not, it has been said, extraverted in the usual sense: this aspect of the continuum is measured by B1-N. In B1-N wholesome contact with the environment is contrasted with withdrawal from it because of maladjustment; in B2-S wholesome independence of environmental support is contrasted with unwholesome dependence on it. The low-scoring person on B2-S is, therefore, extraverted in the literal sense of the word, but he turns to the environment for emotional support rather than for natural outlets. To avoid confusion, it seems wise to continue to use "emotional stability" for B1-N and "self-sufficiency" for B2-S.

B3-I is identical with B1-N, and confusion will be avoided if this scale and its trait name are dropped. "Introversion-extraversion" has come to mean too many things.

B4-D measures the tendency to dominate in face-to-face situations. It is not a "pure" trait, but a composite made up of extraversion, as measured by B1-N, B3-I, or F1-C, and sociability, as measured by F2-S. Low scores indicate submissiveness, but high scores may, of course, be compensatory.

F1-C is a somewhat purer and more consistent measure of the trait assessed by B1-N. The contrasts are made clear below.

F2-S is a measure of sociability. It is more closely related to B2-S than to any other key, but is free from some of the confusion existing between the first two B scales. The F1-C continuum appears to consist of good contact with the environment as opposed to poor; the F2-S, of wholesome liking for contact with others in the environment as opposed to wholesome liking for freedom from such contacts. The F scales are thus concerned, the one with *type*

of contact, the other with *need* for contact, whereas the B scales confuse type and need.

S1-I, the unpublished Schlaudeman scale, is a measure of the extent to which a person differs from people in general in his responses to the Bernreuter items. It is thus a measure of idiosyncrasy, the significance of this deviation not being specifically indicated. Schlaudeman's study shows, however, that the deviations measured are comparable to B1-N and F1-C.

It now remains to draw whatever conclusions concerning the practical value of the Bernreuter Personality Inventory we can from the foregoing review of research with this measure. No attempt will be made to document statements in this section; it will be assumed, instead, that the necessary evidence is in the preceding pages and is now familiar to the reader.

WHAT THE BERNREUTER DOES AND DOES NOT MEASURE

The Bernreuter Personality Inventory has been shown to measure group trends with a reasonable degree of reliability; it can be used with individuals, but with some caution. Some of the items in the test are not suitably weighted for differentiating abnormal from normal individuals, but taken as a whole the items and the weights are adequate, especially when used with nonpsychotics. The Bernreuter scores tend to distinguish neurotics and various types of psychotics from normal individuals, although not perfectly; abnormals in the mass are not differentiated, because of the canceling out of extreme tendencies. Unfavorable scores are indicative of maladjustment, but "favorable" scores do not necessarily indicate good adjustment: they may, in some cases, indicate maladjustment, *e.g.* low neuroticism scores and psychopathic inferiority.

The Inventory is of questionable value in selecting behavior-problem cases: the interplay of personalities and situations is too complex. In student personnel work, those wanting advice on personal matters, those who cheat, those who are independent, those who tend to withdraw, and those who tend to be leaders are selected by the test. Profiles consisting of scores on all keys are especially helpful in diagnosis.

The Bernreuter is not helpful in selecting efficient clerical workers, and its scores are only slightly related to work attitudes. Religious liberals do apparently tend to make higher scores on solitari-

ness, and undergraduate radicals tend to be self-sufficient and otherwise normal.

The happily married are more stable and extraverted than the unhappy, the emotional stability of the wife being more important for marital happiness than that of the husband.

Data on family resemblances agree with logical expectations, couples tending to resemble each other slightly, parent-child relationships following the Freudian pattern, and siblings' resemblances in personality agreeing with the data on intelligence. Family constellation has the expected effects on personality as measured by Bernreuter: oldest and only children tend to be more dominant; those with opposite-sex parent fixations are less stable than those with like-sex identifications. Birth order, in and of itself, is, however, not very significant.

Social group differences are found in agreement with established facts and logical expectation. Some convicts are introverted and others are more extraverted, privileged groups have more desirable traits, foreigners new to a community are less dominant than those established in it, and those with physical handicaps which separate them from others are less stable than normal or less handicapped individuals. Negroes, although underprivileged, have apparently developed socially desirable traits.

Occupational group differences have been disappointing in that they are not so clear-cut as some have expected. There is considerable overlapping, suggesting that there is sufficient variety among the jobs in a given occupation to allow scope for all kinds of personalities in any occupation. In spite of this fact the tendencies are rather definite: those in work involving contact with individuals tend to be more dominant than others, whereas those working with records and objects tend to be less so. Differences in other traits have not been found to be reliable, and in no case are they great enough for individual guidance; other factors are of more importance. Unemployed persons tend to have less desirable traits than the employed, but again the tendency is not sufficiently clear-cut for application to individuals. There is no relationship between Bernreuter scores and success in some occupations, but especially successful teachers, Y.W.C.A. secretaries, and salesmen have been found to be differentiated in expected ways from failures in those occupations.

Data obtained by means of the Bernreuter agree with material

obtained in other ways, to the effect that personality traits have little relationship to physiological measures, except thyroid condition. There is no correlation with chronological age, nor with intelligence, as is logical in view of other evidence, but the expected prevalence of good traits among very intelligent persons is reported by investigators using the Bernreuter Inventory as well as by other types of studies. Bernreuter material agrees with other such studies in finding no relationship between measured personality traits and achievement, whether the analysis is based on correlations or on differences between extreme groups, personality traits affecting only the way in which one uses his ability.

Ratings of individuals, both by themselves and by their associates, have been shown to have a fairly high correlation with Bernreuter scores. Mood, self-interest, test sophistication, and the desire for social approval have less effect on test scores than is generally thought, although signing one's name on a personality inventory does appear to cause one to give a more socially approved picture of oneself. The writer suspects (on the basis of hiring experience) that employment applicants will be found to improve their scores appreciably, but objective evidence to this effect is not available.

Bernreuter scores have been found to be unrelated to suggestibility or to Kent-Rosanoff scores, but inventoried stability and introversion are related to Rorschach-tested stability and introversion, to tested persistence, and to punctuality.

This brief synthesis of findings concerning the Bernreuter Personality Inventory points to the conclusion that it has considerable validity as a research instrument; that when properly used it has some value in work with individuals; that in either type of work care must be taken to secure adequate rapport; and that some situations may be such as to make such rapport out of the question. It thus behooves the researcher and clinician to know when and how the Inventory is likely to give valid results and to use it only in those situations: there appear to be a number of these, as this discussion shows.

Having summarized in this general way the uses to which the Bernreuter has been found to lend itself, it seems desirable to end with a brief description of the empirical value of each of the scoring keys, to supplement the more theoretical discussion concerning the traits they measure.

SIGNIFICANCE OF BERNREUTER SCORES

B1-N. High scores on this scale tend to be made by emotionally unstable persons and by those who tend to withdraw from difficult social situations: neurotics, autistic schizophrenes, depressed individuals, hypothyroid cases, the hard-of-hearing, maladjusted normals, withdrawing individuals, the unhappily married, students seeking interviews on personal matters, cribbers, criminals, nurses, artists (?), persons agitated by frustration, and those who are unsuccessful in contact work. Low scores are made by emotionally stable persons and by those who are aggressive in difficult social situations: paranoid and manic individuals, hyperthyroid cases, leaders, fraternity men, students with good study habits, the happily married, oldest and youngest children, negroes, Y.W. C.A. secretaries, physical education teachers, and persistent and punctual persons.

B2-S. High scores are made by self-sufficient individuals: neurotics (an exception), withdrawing persons, students who support themselves, leaders, those who are intellectually independent, undergraduate radicals, divorced women, youngest children, only children, negroes, very superior students, persistent and punctual people, and persons in contact occupations. Low scores are made by dependent persons: epileptics, cribbers, fraternity men, nurses, and by persons working with records and materials.

B3-I. Resembles *B1-N* empirically as well as theoretically.

B4-D. High scores on this scale are made by persons who tend to dominate in face-to-face situations: employed persons, very superior students, leaders, fraternity men, divorced women, youngest children, those in contact occupations, those in the higher socioeconomic groups, negroes, and Jews. Low scores tend to be made by those who are submissive: epileptics, hypacusics, withdrawing persons, newcomers in a society such as foreigners, the unemployed, nurses, and persons working with records and material objects.

F1-C and *F2-S.* These have not been used in enough studies for empirical data of the above varieties to be available. It has been shown in one study that they have much the same significance as the B scales, *F1-C* being like *B1-N*, and *F2-S* like *B2-S*.

To the theoretically inclined, the above summary may look like the height of empirical folly. Some will wonder at finding leaders classed with paranoids, cribbers with epileptics. A moment's

thought should explain these apparent oddities. A test score represents position on *one* continuum: for this reason unexpected groups will be found rubbing shoulders. To understand any particular group or individual we must, however, take into account more than one trait. When several traits are considered at once, as by St. Clair and Seegers (122), it will be found that leaders and paranoids are no longer bedfellows. At the same time, study of the material just presented will show that there is a substantial amount of logic and consistency in the groups sharing a given trait. It is psychologically as well as empirically sound, to cite just a few examples, to classify neurotics, schizophrenes, depressed and hypothyroid cases, withdrawing individuals, those seeking help in personal matters, and the unsuccessful in contact work as emotionally unstable.

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BOOK REVIEWS

BARTLEY, S. H. *Vision: a study of its basis.* (With an historical perspective by E. G. Boring.) New York: Van Nostrand, 1941. Pp. xv + 350.

In an illuminating historical introduction Professor Edwin G. Boring properly labels this book *a handbook on the psychophysiology of vision*. However, the book is more than a compendium of facts. It is concerned with some of the most important problems in the field of vision and provides a critical review and summary of many new experiments. The newness of the material is attested by the fact that 70% of the 241 end-of-chapter references deal with experimental studies in vision published since 1935; 97%, since 1926.

The author, an active worker in one of the world's foremost neurophysiological laboratories, has a broad background of training and experience in experimental psychology and neurophysiology and is one of the few persons uniquely qualified to write such a book. He dedicates his book to G.H.B. and R.H.W. For nearly a decade the author has been a research associate of the former, George H. Bishop, in his laboratory in the Washington University School of Medicine. To the latter, Raymond H. Wheeler, he no doubt owes his early interest and training in psychology. The influence of viewpoints of both men are discerned throughout the text.

As stated in his introductory preface, the author makes no pretense of surveying the entire field of vision. He has chosen instead to attempt to integrate certain phenomenological and experimental observations in the psychology of vision with some of the more recent neurophysiological data, many of which have been discovered only recently through the application of newly developed techniques in electrophysiology. Better aware of the contributions of electrophysiology to the understanding of the sensory mechanism of cutaneous and muscle receptors, or even in the more complex area of audition, the psychologist and physiologist will no doubt be surprised to learn that such a wealth of data of this kind has been quietly accumulated in the field of vision. Throughout, the author adeptly applies new or expanded neurophysiological concepts, along with anatomical and histological facts, to the better understanding of experiments in the psychology of vision. Again and again theories of vision and experimental results explained in terms of hypothetical peripheral mechanisms or substances are shown to have probable central nervous system coordinates. Occasionally one may get lost in a fine neurophysiological mist, but for the most part the explanations are basic and clear.

The plan of the book is well conceived and appears to follow a systematic ordering of topics. Beginning with visual functions and factors primarily dependent upon peripheral mechanisms of the eye and retina, the author leads to problems and methods bearing more heavily on central nervous system functions, closing with the characteristics of cortical responses recorded electrically. The introductory chapter discusses the nature of vision and outlines various methods of studying visual prob-

lems. A number of fundamental considerations in relation to visual experience are taken up in the second chapter. These pertain to various types of thresholds and the interrelations of area, intensity, and time in brightness discrimination, visual acuity, and binocular vision. Chapter III deals with methods of demonstrating the effects and mode of action of entoptic stray light. Its importance to the interpretation of various experimental studies in vision is frequently stressed throughout the book.

Chapter IV deals with the sense cells and the structure of the retina in relation to visual theory. Hecht's photochemical theory and the duplicity theory of vision are discussed and criticized. Experiments bearing on the anatomy and function of the blind spot are taken up in Chapter V. The importance of the time factor in visual experience is excellently portrayed in Chapter VI, which deals with flicker and fusion phenomena. The detailed results of a number of experiments on the perception of movement are presented in Chapter VII. The various types of perceived movement, both real and apparent, are discussed and explained. Chapter VIII provides a comprehensive treatment of the adaptation phenomena in vision. Theories of adaptation are critically reviewed.

Chapter IX is one of the most important sections of the book, for it gives a clear picture of the latest neurophysiological concepts of neural interaction, especially as applied to visual phenomena. This chapter clarifies many of the neurophysiological conceptions alluded to in earlier chapters and might profitably have been inserted nearer the beginning, although it does form continuity with those chapters on nervous action which follow. Chapter X presents a number of psychological phenomena involving contour, for which the author finds present concepts of neural interaction inadequate and looks to the future and some new theory based on field properties. Both in this chapter and the chapter on perception of movement the author espouses the vector-field analysis of Brown and Voth.

The experimental material and the methods described in Chapters XI, XII, and XIII have never appeared in book form before. The first of these gives a detailed description of the electroretinogram, its characteristics, and their relationship to retinal and sense-cell function in the eye. The next two chapters, the optic nerve discharge and the cortical response, bear almost entirely upon the work of Bartley and Bishop and their collaborators. These chapters form a partial summary of a large number of published studies in which some extraordinary techniques of analysis of neural function have been devised and striking results obtained. The kind of fact uncovered in these studies is basic and will certainly play a prominent part in the theories of vision of the future. Although mentioned in an earlier chapter on sense-cell action, one wonders why the work of Hartline, Graham, and Riggs was not referred to in connection with the optic nerve discharge. The final chapter summarizes accomplishments and calls attention to unsolved problems.

Despite the fact that the author has made a good attempt to simplify and condense a large amount of difficult and technical experimental material, students will not find this an easy text to read, nor for that matter will more experienced hands find the going smooth. However, the juice

that the meat contains is certainly very well worth the chewing. The text is liberally and extremely well illustrated; the format and printing are excellent.

Brown University.

DONALD B. LINDSLEY.

MILLER, N. E., & DOLLARD, J. Social learning and imitation. New Haven: Yale Univ. Press, 1941. Pp. xiv + 341.

Miller and Dollard present in this volume a combination of theoretical discussion and observational and experimental data on learning theory, imitation, and social behavior. The learning theory expounded in the beginning chapters is based on the work of Thorndike, Pavlov, Watson, and, chiefly, Hull. It is, the authors state, most briefly described as "a reinforcement theory of social learning." Emphasis is given to the roles played by drive, the cue stimulus, response, and reward. Learning is defined as occurring when a particular response comes to be elicited more regularly by a specific cue stimulus under conditions which motivate the subject and reward this stimulus-response behavior. The theoretical discussion is deceptively simple, but one should not be misled by that simplicity—considerable penetrating analysis of learning lies behind it.

The theoretical background developed in the first chapters is applied to the process of learning to imitate. The type of imitation discussed in greatest detail may be illustrated by one of their experiments with white rats. The rat serving as leader had previously been trained to approach a black card in a one-choice T-maze; the imitator was now to learn to follow the leader. The factors involved are represented by the authors in this paradigm:

	<i>Leader</i>	<i>Imitator</i>
Drive	Hunger	Hunger
Cue	Color of card	Leader running and turning
Response	Turning toward card	Following leader
Reward	Food	Food

The cue for the imitator is dependent upon, and his response is matched with, the response of the leader. Accordingly, this type of imitation is labeled "matched-dependent" behavior. Both naturalistic observations of child behavior and a number of ingenious experiments are used to illustrate the detailed working out of this pattern in a variety of situations. The experimental results with animals and children "confirm the deductions from learning principles by demonstrating that imitation of a given response will be learned if rewarded and that, when learned in one situation, it will generalize to new, somewhat similar situations." For example, rats trained to follow a white rat as leader followed a black leader with considerably better than chance accuracy. When the drive was changed from hunger to thirst, the imitative behavior was transferred almost perfectly. Finally, the habit was transferred, with slightly better than chance accuracy, to a new, four-choice situation. Rats trained in the

same way not to imitate the original leader showed a similar generalization of this habit.

The final chapters apply the principles of learning and the knowledge of imitation to the process of cultural borrowing, to social situations and crowd behavior in general, and to the behavior of a lynching mob in particular. These extensions are necessarily much less rigorous than the simpler learning experiments, but the more complex social situations may be analyzed and described in terms of the same components which were studied in greater detail in the simpler situations.

The book ends with two appendices, a bibliography, and an index. One appendix revises Holt's famous reflex-circle theory of imitation; the other comments briefly on a number of other theories of imitation and reviews the earlier experimental work on the problem.

The volume was written for the whole group of social scientists and not for psychologists alone. The style adopted for this audience is elementary, somewhat diffuse, and apologized for in advance by the authors. The psychologically-trained reader may wish that the book had been condensed to half its size, but he will be stimulated by the authors' analysis of learning to imitate, and he will find further proof of the power of a systematic theory to suggest new and important experiments. Since most of these experiments are yet to be tried out, *Social learning and imitation* may well serve for some time to come as a significant part of the orientation directing the work of others interested in imitation, social psychology, and group behavior.

DAEL WOLFLE.

University of Chicago.

MORGAN, J. J. B. *Psychology*. New York: Farrar & Rinehart, 1941. Pp. xxi+612.

Among the many recent textbooks in general psychology, this one will hold a high rank for its scholarship, concern with basic concepts derived from experiments, and freedom from adherence to a psychological school of thought. Its chapter headings will have too familiar a ring, suggesting a return to older procedures to those who have stressed applications before fundamentals, but the contents of each chapter have the merit of being grounded in the most recent investigations within the field of psychology. Perhaps the emphasis on description of psychological processes as they relate to specific conditions of stimulation distinguishes this text, although there is not lacking a judicial consideration for the practical implications of psychology.

The seventeen chapters of the book deal with the following major topics: "The Scientific Attitude"; "Heredity and Environment"; "Prenatal and Infant Development"; "Intelligence"; "Springs of Action"; "Social and Infant Development"; "Emotional Behavior"; "The Acquisition of Motor Skills"; "Motives"; "Conditioned Reaction Learning"; "Memorizing"; "The Central Nervous System"; "Vision"; "Hearing"; "Smell, Taste, and Somesthesia"; "Perceiving"; "Problem Solving"; and "The Psychological Individual." This last-named chapter in some texts would be called "Personality." Mor-

gan has, however, gone beyond the ordinary treatment of personality by interrelating in this chapter many of the concepts covered earlier in the book. Most of the chapters are richly illustrated, each sharing appropriately the 192 figures designed to aid the student in grasping methods and results in psychology. Statistical emphasis is slight, as attested by the inclusion of only seven tables.

Two additional features deserve notice. More than is usual, the questions for review suggest that the author has taken his task seriously and, perhaps, has been aided by using them in his teaching. A student who attempts seriously to answer the questions must review his assignment frequently, for the questions are specific rather than general. The second noteworthy and useful aid to the student is the 25-page glossary. This reviewer is pleased to find an instructor who recognizes the problems faced by beginning students as they seek to cement ideas by the use of appropriate, technical terms.

Perhaps some psychologists will wonder why Morgan, in returning to basic concepts, has followed the more recent trend of relegating chapters dealing with nervous integration and sensory processes toward the end of the book. Had he dealt primarily with generalizations and applications, the procedure might have been easier to rationalize. Other psychologists may consider the book too difficult for beginning students; Morgan, himself, seems to sense this. The reviewer believes that superior students must often suffer because of the incompetency or indifference of the "average" student and that they will welcome the confidence inspired by this book in psychology as a body of substantiated knowledge.

CHARLES BIRD.

University of Minnesota.

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WECHSLER, D. The measurement of adult intelligence. (2nd ed.) Baltimore: Williams & Wilkins, 1941. Pp. xi+248.

WHITING, J. W. M. Becoming a Kwoma: teaching and learning in a New Guinea tribe. (With a Foreword by J. Dollard.) New Haven: Yale Univ. Press, 1941. Pp. xix+226.

NOTES AND NEWS

THE department of psychology of Vassar College announces the establishment of the MARGARET FLOY WASHBURN FUND, income from which will provide aid to graduate and undergraduate students of psychology at VASSAR COLLEGE. The Fund represents donations from students and friends of Professor Washburn, as well as the residue of her own estate. During the year 1942-1943 a graduate fellowship of \$1000 will be available.

A special "GRADUATE DIVISION OF CONSERVATION" has recently been organized at Vassar College, the purpose of which is "to qualify leaders in problems of community and mental well-being in a democracy." The department of psychology will participate in the work of this new Division. The degree of Master of Science will be awarded to graduate students who complete satisfactorily an approved program of studies and research.

Graduates of the Division will be eligible to apply for two generous fellowships, which would permit them to continue their work toward the doctorate in an appropriate university: (1) the Katharine Bement Davis Memorial Fellowship (\$2000), for two or more years of constructive research in problems of environmental influence on adolescent mental health; (2) the Myra Reynolds Memorial Fellowship (\$2000), for two or more years of constructive research in problems of mental health.

For further information, write to Lyle H. Lanier, Department of Psychology, Vassar College, Poughkeepsie, New York. Applications for the Washburn Fellowship should be sent by April 1, 1942.

THE EMERGENCY COMMITTEE IN PSYCHOLOGY OF THE NATIONAL RESEARCH COUNCIL hopes to keep an accurate record of the contributions made by psychologists to national defense. In order to keep this record, the Committee publishes this urgent request that every psychologist who is now engaged in, or who later enters into, work directly connected with the country's military effort should inform the National Research Council of his activities. (A detailed statement of duties, or of the nature and results of research programs, is not necessary at this time.) This request is made to psychologists serving in a civilian capacity as well as to those in the armed forces.

Communications should be sent to Mrs. Marion Hale Britten, Division of Anthropology and Psychology, National Research Council, 2101 Constitution Avenue, Washington, D. C.

THE SOCIAL SCIENCE RESEARCH COUNCIL has asked us to inform our readers that less than 300 copies of *The prediction of personal adjustment* (455 pp., \$2.00), by Paul Horst and others, remain in stock. The type is being held, but will have to be broken up by March 15. It is consequently asked that persons intending to order copies do so promptly so that a decision may be made as soon as possible about the printing of an additional supply. It is particularly desired that individuals intending to use this monograph in connection with graduate courses next fall notify the Council now, without any obligation to purchase, of the approximate number of copies which will be required.

Psychological Bulletin

RECENT LITERATURE ON INDIVIDUAL CORRELATES OF CRIME

BY MILTON METFESSEL AND CONSTANCE LOVELL

The University of Southern California

This review of literature on crime and delinquency includes publications from 1930 to 1940. In this extensive field—upon which medicine, sociology, law, and psychology converge—selection of books and articles has been determined by their psychological flavor and their suggestiveness for research:

DEFINITIONS OF CRIME

Michael and Adler (59) have defined crime as behavior prohibited by the criminal code. To them, this legal definition was the only possible one. They felt that a more general definition in terms of violation of the moral code of a group would be ambiguous. The reviewers agree that, if all immoral and unethical acts were called crimes, there would be no need for the term *crime*. In line with their definition, Michael and Adler have used *crime* and *delinquency* as words applied to identical behavior and distinguished only in terms of the offender's age.

Objection has been made by Sutherland (88) to such a legal definition of crime. He called the contention that there would be no crimes if there were no laws one of words only. If stealing were removed from the penal code, legally it would not be a crime; but, Sutherland maintained, the public would still react to such behavior with some punishment. The reviewers feel, however, that many acts in the codes would not be punished if the laws were repealed. Crimes defined as the result of legislative pressure by small groups form a clear-cut example. Sutherland believed that crime involves three elements: a value appreciated by a politically important group; a situation leading some individuals to endanger the value; and resort to coercion against those who disregard the value by those who appreciate it.

The difference between these viewpoints, representative of the

two extremes in definition found, could be resolved if the former implied by the term *criminal code* all acts punished by a group with sovereign power, whether or not stated in written laws. Such usage would be in line with the attempt to define criminals in terms of operations—not the operations of an experimenter but of the sovereign public or its representatives. The first of these operations involves forbidding or requiring certain acts; others include the stages from apprehension to punishment. This approach maintains that to call an individual a criminal requires a *demonstration* of all the operations. It provides an objective basis for work in this field.

MULTIPLE-FACTOR THEORY

The search for a single cause of crime has not been much in evidence during the past decade. In most of the investigations attempting to establish the relationship to offenders of a single factor, it has been either stated or implied that crime is the result of many factors, of which the one studied was but a single instance. Generally, in the case of an individual criminal, some, but not necessarily all, of the correlates of crime have been assumed to be present. Certain of the factors which have been studied were descriptive of individuals; others referred to the environment. This review is confined to literature on several of the individual correlates of crime.

CHRONOLOGICAL AGE

During the past decade, additional evidence has been presented to demonstrate that young people furnish more criminals than their frequency in the population warrants. In the 1930 census, the age group 20 to 24 comprised 8.9% of the population of the United States; but 20.4% of the arrests were within that age range in 1937. On the other hand, the age group over 50 contained 17.2% of the population but only 8.7% of the arrests (71). Similar data for a single state have been secured by Duncan (20). Comparing the ages of Texas prisoners for the years 1906–1924 with the ages of the general male population of the state, he showed that over 83% of the crimes were committed by those under 40, who made up about 66% of the population. These criminals under 40 exceeded their expectancy by almost one-third, whereas the age group 40 to 49 had a crime rate of little more than one-half of its expectancy.

An age curve of crime that rises abruptly through adolescence,

reaches a peak in young manhood (between 19 and 24 years), and declines with maturity was reported by Reckless (71) as descriptive of the age factor in crime. He criticized juvenile court statistics showing a rise to 16 years and then a decline on the grounds that many juvenile courts have no jurisdiction after the age of 16.

To see if young people are gradually contributing a larger percentage of criminals, Wood and Waite (92) compared Michigan prisoners for the years 1875 and 1935. In this 60-year period the average age of convicts increased more than two years. Greater use of probation for first offenders at the present time may account for the increase, but the shortening of prison sentences would have the opposite influence.

In their book on frustration and aggression, Dollard, Doob, Miller, Mowrer, and Sears (19) have pointed out the possibility that crime may tend to be a youthful occupation because, with age, the individual becomes more settled in society, his level of frustration generally decreases, and his responsiveness to the threat of punishment becomes greater.

Police statistics continue to bear out the recognized relation of age to type of crime. In 1940 it was reported (96) that individuals under 25 committed over two-thirds of the auto thefts and over half of the robberies, though only 33% of all arrests and convictions involved this age group. Sixty-seven per cent of demonstrated criminal acts fell in the age groups from 25 to death, but 79% of liquor law violations were attributed to this group. In general, it may be said that crimes against property (excluding fraud, forgery, and embezzlement) have more than their share of youthful perpetrators. Crimes against the person are concentrated above the age of 25.

SEX

For no correlate of crime has there been found a more marked relationship than that between sex and crime. The ratio of male to female arrests at the present time is about 10 to 1 for all offenses, but, since commercialized vice and minor offenses are generally punishable by fine or local imprisonment, the ratio of men to women in federal and state prisons is probably greater. In juvenile delinquency, a similar relationship has been found. Maller (55) reported that 93% of all children classified as delinquents before the New York Children's Court from 1903 to 1936 were males. In the 10-year period beginning with 1925, the ratio was 7 boys to 1

girl. In a study of 149 juvenile delinquents in a rural county in Oregon, Roach (74) found that over twice as many boys as girls were arrested (102 and 47, respectively), but almost an equal number (40 and 39) were committed to institutions. The reason given for this was the fact that girls were sent to maternity hospitals as well as to the industrial school. Ackerson (1) found that the ratio of white boys to girls at the Illinois Institute for Juvenile Research was 5 to 3. The reviewers feel that the increasing ratio of boys to girls as one moves from behavior problems to delinquency to crime should be watched for future developments.

Interpretation of the sex differences in crime in terms of greater aggressiveness on the part of men has been made by Dollard and his collaborators at Yale (19). Back of the aggressiveness lie the greater size and strength of men, their greater activity outside the home, and accepted standards of masculine behavior. As women play a more active part in life outside the home, the ratio of men to women criminals may change. Whether or not from this cause, some evidence of such a change has been reported. In the years from 1902 to 1932 there was a decrease of more than 50% in the number of demonstrated delinquents per 1000 children of court age in New York City. However, this decline was concentrated entirely among the boys, and the ratio of boys to girls has dropped from 60:1 to 8:1 (54).

Sex differences have also been shown for type of crime committed. In the Uniform Crime Reports (96), a comparative study of an average group of 1000 men and 1000 women revealed that the latter were arrested more frequently than the men for murder, assault, use of narcotic drugs, and liquor violations. The men in the study were charged with offenses against property more frequently than the women. The reliability of these differences was not given. Wood and Waite (92) reported that 9.6% of the women and 5.7% of the men committed to state and federal prisons and reformatories in 1935 were there for homicide. Juvenile Court Statistics for 1934 (95) showed that boys were referred to the court most frequently for stealing, carelessness or mischief, and traffic violations, whereas the girls appeared most frequently for being ungovernable, running away, and sex offenses.

RACE AND NATIONALITY

Differences in the crime rates of the individuals representing various races and nationalities have been revealed by many varied

studies. However, with other related factors held constant, it appears likely that membership in a given race or nationality would not be correlated with crime.

Evidence gathered in the past decade supports, in the main, the idea that immigrants are more law-abiding than negroes and native whites. For example, during the first nine months of 1940, for every 100,000 in the population 15 years or older 1290 negroes and 474 native whites were arrested, but only 151 foreign-born whites (96).

Some investigations have indicated also that the crime rate of the children of immigrants is higher than that of the children of native-born whites and of immigrants. Caldwell (11), for example, found that the children of foreign parentage in Wisconsin were "decidedly more delinquent" than those of native parentage when compared to the state's male population of the same age group. Different results were reported from 1930 census data by Taft (89). In 17 of 26 states, the children of native parentage had higher crime rates than the children of foreign parentage. The other 9 states were largely industrial, with large cities and concentrations of recent immigrants. Data supporting Taft's results were found by Ogburn (65). Correlating crime rates and the number of offspring of immigrants in three groups of cities of different size, he obtained coefficients of $-.54$, $-.51$, and $-.34$. Although only the first two are significant, the agreement in direction of these coefficients gives some indication that the presence of the offspring of immigrants may be helpful in keeping down crime rates. Conflicting results from studies of this kind may be due to sampling or to different methods of figuring crime rates (such as including or excluding minor crimes).

Eleanor Glueck (32) compared 121 native-born delinquents of native parentage with 461 native-born delinquents of foreign parentage. After analyzing a number of factors (such as economic status and relations of parents) to see which were advantageous to each group, she concluded that there was less apparent reason for crime to be committed by the children of immigrants than by the children of native-born parents. The reviewers point out that assuming the factors to be of equal weight and adding them on two sides of a ledger is doubtful procedure. Moreover, many questions could be raised as to which factors should be considered advantageous. As a result of this study, Glueck suggested that the conflicts resulting from the different nativity of parents and children

accounted at least partly for the delinquency of the offspring of immigrants.

Sutherland (88) has regarded such cultural conflict as the underlying cause of systematic criminal behavior. As used in the literature on crime, the term apparently applies to inconsistent influences—both restraining and motivating—on the individual. Sellin (80) said that, in the study of conduct, it is necessary to think of culture conflict as a conflict of conduct norms. Native-born children of immigrant parents live frequently in environments in which two standards and sets of rules are in force. Conduct approved by one culture may be disapproved and punished by the other. Immigrant parents may have difficulty in giving their children guidance in an environment which they do not understand; as a result, the children may commit delinquencies in living according to the standards of their parents or in trying to adjust to their nonparental environment.

Opposing such a viewpoint, Ross (77) has contended that the higher delinquency and crime rate of those with immigrant parentage is due to the culture of the socioeconomic environment in which they find themselves. He believed it incorrect to speak of them as a group having the culture neither of their parents nor of the American environment to guide them.

Differences in crime rate have also been found between offspring of the foreign-born of various races. According to Armstrong (5), 70% of the delinquents arraigned yearly before the New York City Court were the children of immigrants. In view of the population of each group, the Italians showed nearly double their expected crime rate, the Russians exceeded theirs, and the Negroes tripled their expected crime rate. Those with rates below their population rates were the English, Germans, Irish, and Austrians. Approximately the same situation held for truants in the city schools. Glueck and Glueck (33), in a study of 1000 delinquents, compared the countries of origin of the foreign-born fathers of the boys with those of the general foreign-born population and discovered that the Irish, Russians, Canadians, and English had lower proportions than expected, whereas the Italians, Poles, Lithuanians, and French Canadians had higher proportions. The Polish, French, Italian, Greek, Scotch, and Lithuanian peoples topped the delinquency list in Caldwell's study (11) in Wisconsin.

Evidence that the type of offense committed is different in the offspring of immigrants than in immigrants themselves has been reported by Stofflet (87). The shift was from crimes of violence to

predatory types of offense. For example, of the crimes of 603 foreign-born criminals, 11.9% were homicides, and 8.6% were cases of burglary. In contrast, the crimes of a group of 878 American-born criminals of foreign parentage were classified as follows: homicide, 5.1%; burglary, 20.8%. These differences were reliable, but the relationship of age of criminal to the various types of crime was not controlled in the study.

Taft (89) has stressed the importance of taking age distributions into account in studies of this factor. For instance, using rate per 100,000 of the male population in the United States 15 years of age or over, the crime rate in 26 states of those of French descent was 35.8 and that of people of Russian descent, 58.1. However, when corrected for the age composition of each of the groups, the rates were 43.3 and 41.8, respectively.

One indication that race differentials in crime may be reduced to other factors comes from Reuter (73), who found that, in general, the rates of negro commitment to prison were lower in the southern states than in the northern states. For instance, in Mississippi, with over half its population negro, 70.9% of the prisoners committed to prison were negroes; whereas in New York, with only 3.3% negroes, 15.7% of the committed prisoners were negroes. Reuter gave three possible explanations for this: the high percentage of northern negroes dwelling in cities as compared to rural areas, the larger proportion of northern negroes in age groups where probability of crime is greatest, and protection by southern whites of negroes who accept inferior status.

Further evidence that racial differentials can be reduced to other factors has come from Shaw (84). He found that areas near the center of Chicago had high delinquency rates regardless of marked changes in the composition of the population. Despite occupation at different times by Germans, Scandinavians, Poles, and Negroes, the delinquency rates of one area remained high.

In terms of their frustration-aggression hypothesis, the Yale collaborators (19) have suggested that racial differences in crime rates may be explained in terms of the relative frustrations which the various races undergo and in terms of the weakening of the threat of punishment by parent groups as new social contacts are made.

PHYSICAL TRAITS

Studies of physical traits and crime have been of two types: those investigating the physical characteristics of offenders and

those studying the incidence of criminals and delinquents in groups with physical disorders.

Comparing 668 native white criminals with a noncriminal group, anthropologist E. A. Hooton (41) came to the conclusion that the primary cause of crime is biological inferiority. Use of a control group of 146 firemen from Tennessee and 167 individuals from Massachusetts hospitals, a national guard unit, and ocean bathers renders this sweeping conclusion of doubtful validity. Even if significant physical inferiority of criminals were found with a more adequate control group, the figures would not show that such inferiority is a direct cause of crime.

Hooton's figures did indicate differences between the various types of offenders. For instance, robbers differed significantly from other criminals in nine morphological traits (such as medium ear protrusion, attached ear lobes, and large beard quantity). However, no single robber had all these characteristics. About $1\frac{1}{2}\%$ of the 414 robbers studied had none at all, and approximately 80% had four or less. These data give evidence that there is no clear-cut physical type characteristic of criminals.

Evidence that there may be a biological factor predisposing to crime has been given by Rosanoff, Handy, and Rosanoff (76). They located 65 adults with prison records, each of whom had a like-sexed twin. Of the 37 who were probably monozygotic, both twins had criminal records in 68% of the cases. Of the 28 cases who were probably dizygotic, both twins had such records in only 18% of the cases.

The physical capacity, rather than structure, of 504 reformatory inmates was studied by Frank and Cleland (29). Measures of force (such as right-hand grip) and velocity (the distance a person could leap into the air) were used, and no significant relationship of the resulting physical capacity index to type of crime was found. The inmates were inferior to 50 guards in the measure of force. They were superior to these men in velocity, but they were not superior to a group of college students more nearly their own age. Negroes were found to excel all other groups in physical capacity. The authors concluded that physical capacity should be considered in deciding the treatment of inmates.

In an investigation of 150 problem boys in Cleveland, Moore (61) found that they were less proficient in most athletic abilities than school children in general. His figures showed, for instance, that normal boys of 14 ran 50 yards in 7.5 seconds, whereas problem boys required 8.5 seconds. Inasmuch as other children possess the same physical deficiencies without be-

coming serious social problems, Moore suggested that problem boys have different methods of compensating for their weaknesses.

Comparing 282 consecutive cases at the San Francisco Juvenile Detention Home with 282 unselected boys from a junior high school with respect to physical disabilities revealed by a thorough physical examination, Christie (15) found that in almost every item the incidence of difficulty was greater among the delinquent boys. Items showing great differences in incidence between the juvenile court and normal boys, respectively, were dental caries—74.8% and 29%; poor oral hygiene—76.7% and 37.6%; and defective tonsils—50.4% and 28.7%.

Orner (69) found that 13 of 21 problem boys had basal metabolic rates within the normal range, but that three times as many showed rates below 90 as above 110 (6 and 2, respectively). The number of cases was too small for definite conclusions, but the similarity of these findings to those of Levy (52) on hyperactive problem children suggested to the author a possible relationship between low basal metabolism and lowered threshold of resistance to impulsive behavior. Both Orner's study and that of Molitch and Eccles (60) on 200 delinquents found no direct relation between basal metabolism and intelligence.

Another approach to the problem of physical traits has been made in a study by Rowe (78). From 4000 cases referred for physical diagnostic study because outward evidences suggested endocrine disorder, the 650 individuals less than 17 years of age were divided into two groups for comparison: 374 who had a demonstrable endocrine disorder (e.g. pituitary dysfunction) and 276 with some disease condition unassociated with the endocrines (e.g. tuberculosis). Of the former group, 18.2% had behavior problems of some sort, in contrast to 13.0% of the latter. These figures suggested a possible endocrine association with behavior problems, Rowe felt, though he did not believe they established the existence of a direct causal relation.

A comparison of encephalitic children with other children in the Illinois Institute for Juvenile Research was made by Jenkins and Ackerson (45). They calculated tetrachoric correlation coefficients between the entry "diagnosis of encephalitis" and about 200 items (using 5000 cases, of whom 57 were given diagnoses of encephalitis and 92, diagnoses of question of encephalitis). The highest correlation was with the item "question of change of personality" ($+ .70 \pm .05$). Other items significantly related to presence of encephalitis were emotional instability, irritability, nervousness, disobedience, and listlessness.

These varied articles agree that there is no distinct physical type associated with crime and delinquency. Most of them concur, also, in the notion that physical disabilities appear to be found more frequently in criminals and problem cases than in the normal population. Why this is the case has not yet been shown definitely. Wood and Waite (92) have made the comment that physical illnesses and other deficiencies go along with the poor economic conditions of prisoners. That physical defects are significant to crim-

inals in some cases because of the effect of the ridicule of others has been suggested by Sutherland (88). This point of view is related to that of the Yale authors (19). They believe that unfortunate facial conformations and bodily incapacities increase the amount of frustration experienced by an individual and may lead to aggressive behavior. What relation there is between physical traits and crime is, then, generally thought of as an indirect one.

INTELLIGENCE

Incidence of Feeble-mindedness Among Offenders

Reports in the past 10 years do not agree on the relative incidence of feeble-mindedness among criminals and the general population. Lack of conclusive evidence on this point has resulted from the use by different investigators of (1) various tests and methods of testing, (2) several criteria of feeble-mindedness, and (3) incomparable samples of both criminals and the general population.

Reviewing studies of about 175,000 offenders, Sutherland (93) found estimates of feeble-mindedness among criminals ranging from 1 to 96%. In the years 1910-1914, the median report was 51%; in studies from 1925-1928, this figure was reduced to 20%. Along with this decrease—partly attributable to changes in testing methods and in classification of offenders—Sutherland reported an increase in the percentage of the general population classified as feeble-minded. He concluded that feeble-mindedness has not been demonstrated to be a generally important cause of crime.

Zeleny (94) calculated, from 163 studies of criminal intelligence using the Binet test, that 30% of 61,999 criminals had been diagnosed as feeble-minded. This percentage did not change over 5% in the different sections of the country, but in individual studies there was variation from 5.5% to 100%. Zeleny suggested that these differences were attributable partly to the influences of the sex of criminals, the tests used, the standards of feeble-mindedness, the type of crime, and so forth. When compared in terms of criteria of feeble-mindedness as nearly constant as possible and in relation to Army draft figures for noncriminals, a selected group of the studies revealed only "slight criminal inferiority." For every noncriminal with a mental age of less than 11, Zeleny estimated that there were 1.8 criminals.

A study of 150 white male adult delinquents—74% of whom were indicted for property crimes—was reported by Shakow and Millard (83). Comparison of results on the Stanford-Binet for this

group and an Army group showed no significant difference in incidence of feeble-mindedness. Also, the two groups did not differ significantly in mean mental age, but the criminal sample had a larger percentage of cases with mental ages between 10 and 12 (51% in contrast to 33%).

Six per cent of 401 reformatory cases were diagnosed as definitely feeble-minded, as compared to more than 7% designated superior, according to Frank (28). No comparison with a control group was made, nor were the bases of diagnosis stated quantitatively.

Studies of the intelligence of criminals have pointed out the possibility that, if a noncriminal control group similar in economic and social status to that of prisoners were used, excessive incidence of feeble-mindedness among the latter would not be found. Lichtenstein and Brown (53) studied 658 grade school children from an area of high delinquency. Approximately 10% of these children had IQ's below 70. Use of this percentage in comparing noncriminals and criminals would often lead to results less unfavorable to offenders. For instance, test results (largely from the Bregman revision of the Army Alpha) for 13,454 adult male admissions into prisons from 1930 to 1936 revealed 10.2% with IQ's below 70 (8). The authors compared this result with the theoretical frequency of 1% feeble-mindedness for the general population and concluded that there were a disproportionate number of mentally retarded inmates in this prison group. The same conclusion could not have been drawn if 10% of the noncriminal population of similar status had been estimated to be feeble-minded.

Other studies have attempted to use as controls individuals of the same general status and have still shown disproportionate numbers of feeble-minded among offenders. Comparison of Kuhlmann-Anderson IQ's for 528 reform school boys (352 white and 176 negro) and 344 public school boys of the same status (172 white and 172 negro) was made by Charles (12). Of the delinquents, 29.5% of the white boys and 47.3% of the negro boys had IQ's under 70. In the public school group, the figures were 1.16% and 3.48%, respectively.

From his survey of studies of the problem, Doll (18) concluded that imprisoned adult males are not significantly inferior to non-criminals in intelligence, *except for the prevalence of feeble-mindedness* and the influence of selective factors in relation to social status, but that feeble-mindedness is a very serious individual in-

fluence in criminality. No figures were given in support of these statements. Important as Doll believed feeble-mindedness to be, however, he thought that even it should not be taken as an explanation of criminal conduct without considering other contributory factors.

That the connection of feeble-mindedness and crime is no simple one has also been indicated by studies of the complicating influence of other factors. Erickson's study (26) of Wisconsin criminals indicated that the feeble-minded individual of foreign birth is responsible for a great excess of crime over his fair quota as determined by population ratios (an excess ranging from 230 to 250%), whereas this was not true of non-feeble-minded immigrants. Studying a group of institutionalized delinquents, Lane and Witty (50) found that boys who had been living with their parents had a mean IQ of 91.8, whereas those who came from broken homes had a mean IQ of 88.7. The D/σ_D was 2.53.

Intelligence Test Scores of Offenders

In addition to studies of the relation of feeble-mindedness to crime, there have been investigations of the distribution curves and averages of the test scores of offenders.

Moore (63) gave the Otis S-A test to 152 institutionalized delinquent boys and to 157 institutionalized dependent boys of the same age range. The median IQ's with the Otis norm were 68.9 and 86.4, respectively; with a 14-year norm, they were 74.4 and 89.9. Use of a nonverbal test on 148 of the delinquent boys and 118 dependent boys resulted in IQ's of 85.7 and 100. All these differences favoring the dependent boys were statistically reliable. Eighty-two per cent of the delinquent boys had IQ's below 90 when calculations were made with the 14-year norm.

The average IQ on Dearborn exams for literate whites in a group of 103 prison farm boys was reported by Ruggles (79) to be 73. That for illiterates was 75.

Jameson (44) found a median IQ of 81 and a range from 57 to 126 in a study of 106 institutionalized delinquent girls.

According to a study by Rogers and Austin (75), the mean IQ of 3584 Toronto delinquents was 82.2. That this peak for delinquency may in part be ascribed to the difficulties in school of the dull normal group was the authors' suggestion from their findings. The IQ's for the group—most of them from the Stanford-Binet test—distributed themselves according to the normal frequency curve.

Owen's statistical summary (70) of 21 studies of institutionalized delinquents from 1918 to 1936 showed a mean IQ of $82.4 \pm .18$. Four studies reported during the years 1918–1921 and five studies during 1932–1935 gave mean IQ's of 78.1 and 83.6, respectively. This significant increase may be attributable to different testing methods and to the present prac-

tice of eliminating feeble-minded delinquents from correctional schools.

In 10 studies of delinquent boys in which central IQ was given, Lane and Witty (50) reported scores ranging from 74.8 to 90. Their own investigation of approximately 700 delinquent boys gave a mean IQ of 87.96 and a distribution in which more than 80% were below the average of unselected children studied by Terman. Ten per cent had IQ's below 70. The authors pointed out that probably the group would not be inferior to a nondelinquent group of the same social and economic status.

An investigation of 428 recidivists by Mann and Mann (56) resulted in a mean of approximately 78, in contrast to the mean IQ of 84.45 obtained for the total group of 1731 delinquents. Shakow and Millard's study (83) of 150 white male delinquents, most of whom were recidivists, gave a mean Stanford-Binet IQ (14-year basis) of 88.6. The author pointed out that this group did not differ significantly from an Army group in mean mental age, but it did have a larger proportion of subjects at dull intellectual levels.

From their study of 13,454 adult male prisoners, Brown and Hartman (8) reported that they had approximately the same level of intelligence as the general population (as revealed by the Army draft figures). However, compared to the theoretical frequency for the whole population, the distribution for prisoners was more heterogeneous, showed a disproportionate number of mentally retarded and mentally defective men, and approximately the same proportion of superior and very superior individuals.

A group of 1285 young male offenders studied by Hill (38) had a median Alpha score of 72.94 in contrast to the median of 53.28 of 1047 select members of the Army draft. Only 4% fell in the D-, or very inferior class, but Hill pointed out that the group fell predominately in the dull normal class.

Lichtenstein and Brown's study of a delinquency area (53), cited in the previous section, showed the mean intelligence quotient to be 91.7, somewhat higher than the figure generally quoted for delinquents despite the similarity of background involved.

Glueck (31) compared 1000 juvenile delinquents with 3638 school children and obtained the following distributions: IQ 91 and above—41.6% and 79%; 81-90—28.2% and 14%; 71-80—17.1% and 5.5%; 70 or below—13.1% and 1.5%. She pointed out that this evidence was confirmed by findings on 500 delinquent women and 500 criminals as well as by other data from juvenile delinquents. Her data led her to say that the expectancy of delinquency among those of lower intelligence is at least five times as great as for those of higher intelligence.

Ackerson (1) has reported a study of the relation of age and intelligence to personality and conduct disorders in 4592 white children examined at a behavior clinic. The incidence of 154 frequently appearing problems was tabulated, as well as a personality-

total and a conduct-total (summations of the problems under two main heads) for each child. The incidence curves for either CA or IQ level were found to vary with the trait in question. Rise in occurrence with increase in CA or IQ was characteristic of the largest single group of curves (*e.g.* daydreaming, laziness). Other curves decreased, remained level, or arched in the middle, when plotted against either CA or IQ. Ackerson found that, among pre-adolescent children, the average number of behavior difficulties increased with IQ level up to about 110-120 IQ, beyond which there was probably a decrease, especially among conduct problems. Among children from 13 to 18, the average number of behavior difficulties increased with IQ level up to about 70-80 IQ, beyond which there was a decrease, especially among conduct problems.

The incidence of behavior problems in a group of 700 cases referred to a clinic was studied by Levy (51). No individuals with IQ below 80 were included. Levy reported that, as intelligence level rose, the percentage of personality and emotional problems present in the group rose from 25 to 53 and the percentage of physiological problems rose from 13 to 23. In contrast, the percentage of delinquency decreased from 32 to 12 and the percentage of academic problems from 17 to 4. Because of the possibility that the type of problem might be intimately connected with economic level, a group of 50 youngsters with IQ's over 110 who belonged to the lowest economic scale was compared with a group of 70 children with IQ's between 80 and 90 who belonged to the highest economic level. Indicating that type of problem is more closely connected with intelligence than economic level, the problems of the former group were primarily personality difficulties and those of the latter group were largely social problems. The differences were statistically significant.

A different type of approach to the problem of intelligence and crime has been made by Chassell (13). She surveyed almost 300 studies of the relation between morality and intellect, covering data on approximately 11,000 feeble-minded, 300,000 delinquents, and 12,000 nondelinquents. Noncorrelational data, where possible, were calculated in terms of coefficients of colligation, and altogether 700 coefficients of various sorts formed the basis for the conclusions drawn. In the groups studied, she found correlations varying from .10 to .39, and she estimated that the true relation would be under .50. She estimated, also, that for the population at large the correlation between these two variables would be higher, but not larger than .70.

Selling and Stein (82) have pointed out that the delinquent boy is handicapped on tests which involve verbal responses. Comparing 100 boys from a corrective school with 100 public school boys on a vocabulary test designed to allow for choice of either delinquent or nondelinquent meanings, they found a significant difference between the scores of the two groups.

Besides studies using the customary verbal tests of intelligence, attempts have also been made to differentiate offenders from the general population in terms of scores on other types of test. Hinrichs (39) reported differences (both by descriptive and scoring techniques) found between delinquent and nondelinquent boys on the Goodenough drawing test. His main experimental group consisted of 81 delinquent boys from a state institution. Four control groups of nondelinquents were used: one departing from the delinquents both in academic ability and economic level; one departing in academic ability with economic level held constant; one similar in both academic ability and economic level; and one similar in home background and institutionalization, selected from a state home for dependent and neglected children. The secondary groups consisted of 29 feeble-minded children with a conduct disorder and 40 feeble-minded with acceptable conduct. Mean scores for the groups showed consistent inferiority of the delinquent. Not all the differences between the separate groups were significant, but all showed the same trend. In addition, single pairs selected for rigid control of age and intelligence showed the delinquent inferior to the control more often than superior. That behavior problems were associated with low drawing score was further suggested by results from comparing the two feeble-minded groups in whom behavior was the only variable. On the qualitative side, inferiority of delinquents was shown by the juvenile nature of their choice of character for drawing and by the incongruous elements introduced. That the drawing test may be a worth-while addition to ordinary tests for use with delinquents was indicated by its low correlation with general intelligence test scores and its positive, though slight, correlation with Furfey Developmental Age results.

Another test with possible value for work with delinquents is the Porteus maze test, believed by its designer to cover prudent and preconsidered action not tested in the Binet. Comparing the results of 185 socially maladjusted and 185 socially adjusted children, Karpeles (46) found that the adjusted children tended to make higher averages on the mazes than on the Stanford-Binet (94.31 and 86.24), whereas the maladjusted children evidenced no significant difference in performance on these two tests (84.62 and 86.04). In fact, maladjusted children with IQ's

above 80 tended to make a lower average on the mazes than on the Stanford (89.5 and 93.6). This was not true of all types of delinquents, however; for instance, thieves averaged higher on the Porteus test than on the Stanford-Binet. In comparing the average score on the mazes made by the control subjects with that of the maladjusted subjects, Karpeles found that the former had a significantly higher average (94.31 and 86.04). She pointed out that this study strengthened Porteus' claim that scores on the maze test are lower in delinquency and confirmed findings of Poull and Montgomery made on subjects with lower intelligence.

Different results were obtained by Shakow and Millard (83). In their psychometric study of 150 white male adult delinquents, 68 had better scores on the Porteus test than on the Stanford, 2 had equal scores, and 38 had lower scores. They suggested that the type of delinquent case used may have been a factor in these results.

In a study of 203 delinquents, Knight (48) found an insignificant difference between the mean IQ on the Stanford-Binet and the mean PQ on the Arthur performance test (91.70 and 92.04, respectively). However, since the correlation between the two was only $+ .56 \pm .03$, the author pointed out the value of the Arthur as a supplement to the other test.

Lane and Witty (49) reported results on educational and intelligence tests given to approximately 650 boy delinquents when they entered an institution. The median CA of the group was 14 years, 5.6 months. The median mental age (from the Otis group test of mental ability) was 12 years, 9.4 months; the median educational age was 11 years, 6 months. Thus, the educational age of the boys was, on the average, about 3 years below their CA and 1 year, 3 months below their MA.

Of 3164 girls referred to the Women's Protective Association of Cleveland (17), only 47 were ranked as of superior intelligence. A large percentage of these cases had emotionally unstable parents, 33 lived in broken homes, and almost none were engaged in professional work for which they were qualified. The author commented that superior intelligence, when handicapped by emotional instability, poverty, lack of training, etc., may complicate the problem of adjustment.

The studies listed in this section and the previous one show clearly that low intelligence is not regarded as the important cause of crime that it was in the early days of intelligence testing. There is considerable disagreement as to just how important this correlate is, but the studies do, in the main, support placing the typical delinquent in the dull normal class. Any general statement as to the relative intelligence of offenders and nonoffenders is difficult. It appears safe to say that most results show inferiority of the test scores of criminals in comparison to the theoretical distribution of the population (the validity of which appears doubtful). Smaller differences have been found between offenders and such samples of the population as the Army draft, but no clear-cut conclusion can be drawn even from these, because the representative quality of these noncriminal groups is questionable.

Owen (70) has pointed out that, even if it were shown that most criminals are feeble-minded, it would not follow that the low intelligence itself caused the criminal behavior. Most writers at the present time consider the fact that many other influences may be operating. It appears to be generally recognized that low intelligence may, in individual cases, be a direct cause of crime, whereas in others it may be an indirect cause or merely an accompaniment of actual causes. For example, Hill (38) has suggested the possibility of a relationship between low mental ability and crime through difficulty in school. Interpreting the relationship of intelligence and crime in terms of the greater frustration and diminished effectiveness of the threat of punishment among those of low intelligence, the Yale collaborators (19) have suggested that the relation is not higher because of the low level of aspiration likely to accompany low intelligence.

Most present-day writers would support Doll's statement (18) that the complexity of the selective factors involved in criminal groups makes it difficult to isolate the influence of a single factor, such as intelligence.

Intelligence in Relation to Age of Offenders

Worthy of consideration is Doll's conclusion (18) that intelligence is a more significant factor among juvenile delinquents than among adult prisoners. It was based on a survey of studies in New Jersey institutions which showed consistently, over a number of years, about 30% of delinquent boys to be feeble-minded, about 15% of reformatory young men, and about 8% of adult male prisoners. These estimates considered the influences of age, color, nationality, etc. A possible explanation for such a decrease lies in the facts that juvenile offenders include a larger percentage of individuals committed for petty crimes and that intelligence is more likely to be a factor in whether or not less serious offenders are brought before the police. Studies of the intelligence of adult petty thieves, for instance, might be revealing.

Ackerson (1) reported from his study of problem children that, for those below 80 IQ, the change in number of problems present was not great up to the age of 18. Among those with IQ above 80, the behavior prognosis was poor below the tenth to twelfth years, but more favorable after this. He suggested that the interaction of the age and intelligence factors may produce the effect of increasing the number of behavior problems within the lower age and IQ ranges and of inhibiting them within the upper age and IQ ranges.

Almost 20 years after a group of 166 subnormal children had been

studied, Fairbank (27) got follow-up information on them and compared them with 90 "normal" children from the original survey. Twenty-five per cent of the subnormal group had juvenile or police records, in contrast to 11% of the normal group. The fact that relatively few of the juvenile court cases (8 out of the 26 subnormal cases and 2 out of the 4 normal cases) turned up in the police court suggested to the author that early delinquency tendencies are apt to disappear as the child develops. This was supported by evidence that only 15 of the 34 subnormal cases in whom delinquency traits were noted later had court records.

Zeleny's survey (94) of 163 studies showed fewer feeble-minded (by no standard criterion) among juvenile delinquents (25.6% of the boys and 39.0% of the girls) than among adult criminals (28.0% of the men and 43.6% of the women). However, when attempt was made to bring the studies to a more comparable basis, the ratio of feeble-minded between offenders and nonoffenders was 2.7:1 for girl delinquents and 2.8:1 for adult female criminals, but 1.8:1 for boy delinquents and only 1.3:1 for male adult criminals.

Within the group of juvenile delinquents alone, some evidence for lower intelligence with higher age has been found. In his study of delinquent and public school boys, Charles (12) found a decrease in mean IQ's from 12 to 16 years of age in both groups. He pointed out that this was not unexpected, since, for tests that give correct mental ages at all mental levels, intelligence quotients below 100 tend to decrease and above 100 tend to increase as the age of the group increases. Lichtenstein and Brown (53) obtained a similar trend in their survey of a delinquency area. The average IQ decreased from 99 for the 9-year-old group to 79 for the 15-year-old group. On the other hand, with the Kuhlmann-Anderson Group Test of Intelligence, Hales (34) found an average increase of 6.23 IQ points in a group of 118 reformatory inmates who were retested after an average period of 4.7 years.

Intelligence in Relation to Type of Crime

Sutherland's summary of studies (93) led him to believe that type of crime is affected somewhat by intelligence. He stated that those convicted of fraud are usually a more intelligent group and that sex offenders are generally a less intelligent group. Evidence was inconclusive for other specific offenses. For crimes grouped into general types, he thought it safe to regard those convicted of crimes of acquisition as a relatively superior group and those convicted of sex crimes as a relatively inferior one.

Indication that forgery and embezzlement occurred most frequently among the superior group was found by Frank in his study of 401 male delinquents (28). In his group, assault, rape, and other sex crimes tended to occur most frequently among the mentally deficient. However, he suggested that probably the particular crime committed is influenced more by specific conditions in the situation than by any one factor—even mental level.

Charles (12), in his study of reform school boys, found the mean IQ of those convicted for grand larceny or for burglary and larceny higher than for any other crime, though differences were small.

Similar tendencies were found by Hill (38), with the qualification that the relation between type of crime and intelligence was not clear-cut or conclusive. In his study of 1285 young male offenders, the average of those committed for the two most frequent sex offenses fell below the general average of the entire group, although the three boys convicted of contributing to delinquency, a sex offense, were quite high in mental ability.

Differences in the type of offense committed were also found by Glueck (31), who divided her 1000 delinquents into two groups: those below 81 IQ and those 81 and above. Property crimes had been committed by fewer offenders with low intelligence. They had been arrested in greater proportions than the upper group for stubbornness, destroying state property, running away, and similar offenses.

White and Fenton (91), comparing 117 institutionalized delinquents whose IQ's were greater than 95 with 160 whose IQ's were less than 95, found significant relationship between forgery and high intelligence, but the linkage of sex offenses with low intelligence was not statistically reliable. The authors pointed out that this may have resulted from the fact that all recorded instances of sex offense were included, not only the gross ones used as causes of court proceedings.

The percentage of feeble-mindedness for specific types of crime has been pointed out in some studies. Erickson (26), investigating 170 cases of abandonment, found 35% of them feeble-minded as compared to 18.2% of a group of 1500 general criminals. Abandonments by feeble-minded, he reported, occurred nearly three times as frequently as abandonments by comparable individuals of normal or nearly normal intelligence. Comparing 2049 women sex offenders and 2731 women nonsex or mixed offenders, Zeleny (94) reported that 51.5% and 37.6%, respectively, were classed as feeble-minded.

A comparison of 100 institutionalized auto thieves with 100 delinquents selected at random from the institution showed the former to have a higher median IQ (90 and 83). The author (81) concluded that, though there may have been a trend toward low intelligence in this group, it was not the significant factor in the delinquency.

Fifty white male truants and 50 white male nontruant delinquents, matched for chronological age, were compared by Murphy (64). The latter were superior to the former in intelligence (mean IQ of 81.1 and 86.9), in educational age (nontruancy group 1.1 years more advanced on the Stanford Achievement Test), and in general physical condition.

Burkey (10) made a study of 100 delinquent boys over 21 with IQ from 80 to 118, and 98 with IQ from 50 to 75, to see if there were any trend in the sequence of delinquencies committed. She found that the normal group began their delinquencies more frequently with stealing than did the subnormal group (42% and 28.6%), whereas the subnormal group began more often with sex offenses (3% and 8.2%). Differences in subsequent offenses were also found. For instance, the normal who began

with truancy tended to turn to stealing more often than the subnormal (58% and 34%).

An interesting study of the relation of mechanical ability to crime was made by Ruggles (79). Investigating 103 white boys on a prison farm, he found that crimes whose commission required mechanical ability were carried out by boys ranking highest on the Minnesota Paper Formboard Tests. His study also showed that, of the six sex crimes committed by his group, the baser ones were perpetrated by feeble-minded boys.

Studying 3294 behavior problem children with IQ from 50 to about 150, Ackerson (3) concluded that the following conditions appeared to be significantly related to mental deficiency of higher grade: retardation in school, slow or dull manner, mentally defective sibling, oversuggestibility, staff notation of unfavorable conduct prognosis, preference for younger children as playmates, object of teasing by other children, and question of hypophrenia. Correlations between intelligence quotient and conduct total were $+ .13 \pm .01$ for boys and $+ .12 \pm .02$ for girls; between intelligence quotient and personality total, $+ .15 \pm .01$ for boys and $+ .16 \pm .02$ for girls; between intelligence quotient and police arrest, $- .02 \pm .02$ for boys and $- .07 \pm .03$ for girls.

Intelligence in Relation to Sex of Offenders

A sex difference in the number of feeble-minded criminals has been reported by Zeleny (94) from his survey of 163 studies. Of the men, 28.0%, and of the women, 43.6% were so classified. Confirmation of this statistically significant difference was found by studying the juvenile delinquents. Classifications of feeble-mindedness were given to 25.6% of the boys and 39.0% of the girls. Similar results were obtained when Zeleny attempted to bring the studies to a comparable basis. The ratio of male criminal to noncriminal feeble-minded was 1.3:1; that for women, 2.8:1. For juvenile delinquents the ratios were 1.8:1 (boys) and 2.7:1 (girls).

Comparing IQ's of boys and girls in 3920 cases in which sex was noted, Owen (70) reported a mean of 81.54 for boys and 80.42 for girls. The D/σ_D of the difference between these means was 2.2.

In a study of 602 cases brought before a juvenile court, McClure (58) found that the mean Stanford-Binet IQ of the 435 boys was 80.03 and that of the 167 girls, 77.27. The D/σ_D of these figures was 2.2.

Intelligence and Recidivism

Doll (18) has pointed out that, if low intelligence is a cause of crime, theoretically recidivists should form the lowest of all intelligence groups. His survey led him to state that just the reverse is the case. He attributed this partly to a relation between recidivism, type of crime, and selective influences on the basis of social status.

Thirty-three per cent of the feeble-minded among the 401 male delinquents studied by Frank (28) had prior commitments, as compared to a maximum of 20% in any of his three groups of highest intelligence. Seventy per cent of them had been arrested previously in comparison to 50.4% of the average group in intelligence.

A lower mean IQ (approximately 78) for 428 recidivists than for a group of 1731 delinquents (84.45) was reported by Mann and Mann (56). Glueck's study of 1000 delinquents gave evidence in the same direction (31).

However, Lane and Witty (50) reported that in their group of 700 delinquents, recidivists and nonrecidivists did not differ from each other in intelligence level; and in Hill's study (38) data supporting Doll's contention were obtained. He found, in 1285 male offenders, that the median Alpha score of first offenders was 63.0; that of occasional offenders, 70.0; and that of habitual offenders, 77.1 (though the differences were not significant).

From examination of recent material on the relation of intelligence and other factors to crime, it appears to the reviewers that those correlates which may be stated vaguely are presented by the various authors with considerable conviction as to their accuracy and importance. When factors are made specific and subject to rigorous scrutiny, less assurance is shown that any given one is significantly related to crime. On this account, intelligence as a factor probably is underevaluated, and vaguer concepts, such as "bad parents," probably are overevaluated.

SPECIFIC PERSONALITY TRAITS

Studies of offenders by means of a number of different personality tests have been reported.

Using the Pressey Interest-Attitude Tests (which question concerning things considered wrong, anxieties, interests, and kinds of people admired), Durea (23) devised a method for selecting items maximally effective in differentiating delinquents and nondelinquents. This involved choosing those items which showed the largest differences in incidence between delinquents and normals. The items were then ranked according to the size of these differences between normal and delinquent groups and according to the age groups for which the differences were found. Qualitative analysis of results from 316 delinquents indicated (1) that of things considered wrong, undesirable social traits, such as being conceited, were of negative concern; (2) that emphasis on items of worry, such as sins, seemed to indicate the presence of a pronounced morbid strain; (3) that interests were mostly of a relatively superficial nature, such as circus; and (4) that reactions to kinds of people admired indicated egocentricity on the part of the delinquents.

Applying his method to two new samples of offenders, Durea

(24) found a reliable difference between the means of a 13-year-old delinquent group (34 cases with mean differential weighted score of 19.6) and a control group of the same age (61 cases with a mean score of 10.5). The $D/P.E.D$ was 7.2. The other sample compared 115 delinquents of various ages with 374 nondelinquents. Results gave a difference of 7.6 points between the mean differential weighted scores (15.3 and 7.7, respectively) for the two groups, with a $D/P.E.D$ of 14.5. The author recognized the possibility that institutionalization itself may have affected the scores somewhat. He also recognized overlapping in the scores of delinquents and nondelinquents, but believed that an individual who (1) was retarded two and a half or more years in emotional age as measured by total Pressey score and (2) had a high score on the differential items should be studied for possible delinquency.

For the original group of 316 delinquents, little or no relationship was shown to exist between the differential scores obtained by Durea's method and degree of delinquency (as measured by Durea's delinquency index). However, correlations ranging from $-.62 \pm .05$ to $-.77 \pm .03$ between differential weighted scores and emotional age were obtained. Using as measures the total scores on the Pressey Interest-Attitude Tests, as well as the scores on the individual parts, Durea (22) found evidence that delinquents are retarded emotionally as compared with norms established on nondelinquents. Extent of retardation varied from age to age. There was less at ages 14 and 15 than at 16 and 17, for instance. Although no significant relationship was found between emotional age and degree of delinquent behavior, Durea believed the fact of emotional retardation suggested that emotional maturity is probably as important as intelligence in understanding the delinquent personality.

To find personality traits which distinguish least serious from most serious offenders, Durea (25) selected from 316 boys the 64 who received the highest delinquency index and the 64 who received the lowest. This index consisted of the sum of standard scores for three operations: length of time a subject had been an offender, total number of times a subject had appeared in Juvenile Court, and total weighted values for types of offense committed. Results for these subjects on the Pressey Interest-Attitude Tests indicated certain definite differences between least and most offensive offenders. Of the items which met the author's standard of differentiating between the groups (items at or above the 75th

percentile in the distribution of differences), preponderant weighting for the least serious group in items related to blameworthy circumstances suggested the presence of heightened sensitiveness to wrongs as an accompaniment of moderate degrees of offense. The most serious group was distinguished from the least serious group on only one item relating to blame—yellowness. But this high group was distinguishable from the low on the basis of the presence of more fear and anxiety states. In regard to objects of interest, those with high delinquency index showed differential responses to *shooting, movie star, card parties, and soldiers*; whereas those with low delinquency index marked *dominoes, children, and Sunday School* significantly more times. The reviewers point out the possibility that the less serious delinquents may have been more eager to show that they were "good." In connection with traits admired in others, the group with high delinquency index was distinguished from the low group by interest in factors relating to personal prestige, such as *rich, inventive, and expert*. Not so highly regarded by the more serious delinquents were such items as *generous, discreet, and humorous*.

Prior to Durea's work, Courthial (16) studied the emotional differences between 78 delinquent and 78 nondelinquent girls in the IQ range of 80 to 119. The groups were paired by chronological age, intelligence, cultural environment, and occupational level of father. With the three tests in the Pressey X-O, Form B, she found that (1) the delinquent girls marked fewer things wrong, (2) they had more worries, and (3) they had a wider variety of interests. The first two of these differences were large enough to be considered very reliable. Analysis of the specific items crossed out led Courthial to characterize the delinquent girls as more strongly emotional, with a lack of inhibitory forces and a range of interests probably leading to cravings and unrest. On the Woodworth-Mathews questionnaire of neurotic tendencies, the mean scores of the delinquents was 20.2, as compared with 11.6 for the nondelinquents. This difference was reliable. Examination of the answers given revealed that the delinquent girls had more conflicts with their environment, were not as well adjusted socially, and suffered more from feelings of physical discomfort. For the same groups, Courthial also reported a reliable difference on the Margaret Otis Test for suggestibility, in the direction of greater resistance to suggestion on the part of the delinquents. Similarly, on the Strong Resistance Test, the delinquent girls were reliably more

persistent than the control group. Courthial interpreted these findings as signs of strong individuality in the delinquent girls.

In a report by Ball (6), comparison was made of 135 prisoners from San Quentin and 319 pre- and postarmistice cases (a selected unstable group referred for treatment) previously studied by Hollingworth. The distribution of scores of the prison men on the Woodworth Personal Data Sheet was more symmetrical and had less variability than the scores of Hollingworth's group. In general, the comparative data showed similar results (mean of prison group, 17.83; P.E., .685; and mean of Hollingworth's group, 19.02; P.E., .416), but differences were noted in the types of response made. The kind of symptom characteristic of the prison group was more vague than the unfavorable responses of Hollingworth's group, which showed more clear-cut indications of emotional instability. For instance, sleep disturbances, worries, desire to steal, quick change of moods, and frequent change of interests were answered by 25% or more of the prison group; whereas Hollingworth's group was more characterized by feelings of illness, night terrors, sleep disturbances, dreams, tiredness, cardiac disturbances, bodily pains, feelings of not being their old selves, perseveration, etc. Ball concluded that a purely arbitrary number of unfavorable responses used as a criterion for the selection of unstable groups is not good procedure unless considered in the light of their qualitative aspects.

The Woodworth-Mathews Personal Data Sheet was also given by Snyder (86) to 100 delinquent boys and 100 delinquent girls. The girls were slightly more emotionally unstable than the boys. They revealed more markedly the tendencies (1) to have a dream life, (2) to feel that they were not understood, and (3) to be afraid of fire. More of the boys felt as though they had been wicked and complained of food and physical ailments.

Simpson (85) administered the Thurstone Personality Schedule (or Neurotic Inventory) to 252 male prisoners. Their average score was 44.6, exceeding that found by Thurstone with college freshmen by 8.6 points. Inmates afflicted with syphilis had a mean score of 51.2. Simpson found a coefficient of mean square contingency of +.34 between scores on the Personality Schedule and number of sentences. However, a similar coefficient between average length of time spent on jobs, sometimes regarded as indicative of emotional stability, and test scores was $-.038 \pm .042$.

The Thurstone and Thurstone Neurotic Inventory (revised) was used with 138 North Carolina women prisoners by Garrison (30), who compared their individual answers to the same questions used in a previous study of unselected girls by Mathews. Garrison's group exceeded Mathews' to the greatest extent in their desires (1) to be alone (51% and 15%); (2) to run away from home (60% and 4%); (3) to commit suicide

(26% and 1%); and in their expressions of temper (84.1% and 13%), feelings of misery (54% and 12%), and feelings of persecution (e.g. being badly treated by family—48% and 1%). Other questions revealed smaller differences, but the author concluded that the study showed a preponderance of emotional instability on the part of the delinquent women.

Significant differences between a group of 423 delinquent boys and a group of 419 public school boys on the Personal Attitudes Test for Younger Boys (Sweet) were found by Reusser (72). The former tended to be more critical than the average boy, to feel themselves more different from the average boy, to feel themselves nearer the ideal, and to be less able to estimate the feelings of others.

After pointing out that positive trait reactions (emotional stability, self-sufficiency, extroversion, etc., as measured by the Bernreuter inventory) tend to increase with age in an ordinary population, Horsch and Davis (42) reported a different result in the offenders they studied. Two hundred and twenty-nine industrial school inmates, 232 reformatory inmates, and 157 penitentiary inmates were tested. Positive trait reactions did increase from the lower age level of the industrial school through the reformatory, but the penitentiary inmates were lower than the reformatory inmates in everything except self-sufficiency. In emotional stability, extroversion, and dominance, they dropped from the position of those in the reformatory to just above the industrial school group. The authors considered it reasonable to suppose that the penitentiary environment with its longer exposure to restrictions developed the trend toward unsocial and introvertive reactions. In general, comparisons indicated fewer positive traits in industrial school inmates and penitentiary inmates than in the corresponding noncriminal population, but more positive traits in the reformatory inmates than among college students.

Fred Brown (9) utilized boys at three summer camps for comparative studies with the Brown Personality Inventory and the Furfey Developmental Age Scale. Ninety-one nondelinquent boys of average socioeconomic status excelled 112 predelinquent boys and 71 delinquent boys of low socioeconomic status in (1) emotional stability and (2) security scores. In addition, the nondelinquents had fewer symptoms of nervousness and were less irritable than the predelinquents. The predelinquents and delinquents were comparable in emotional stability, but the former were somewhat more irritable than the latter. The nondelinquents had higher developmental quotients than the predelinquents, who in turn excelled the delinquents. The nondelinquents also had higher developmental ages than the predelinquents, but this was not the case in comparison with the delinquents.

No significant relationship between degree of juvenile delinquency and social maturity (as measured by the Furfey Scale for Developmental Age) was found by Durea (21) in his study of 365 white boys in an Ohio industrial school. Indicators of the degree of juvenile delinquency used were frequency of appearance in the juvenile court, number of offenses committed, and the sum of weights assigned to the various types of offense (stealing, for instance, was given a weight of 27, and burglary, a weight of 39).

A ratio of 3 introverts to 1 extrovert (as determined by scores on the Neymann-Kohlstedt test) was found in a group of 136 native-born, literate male prisoners, age 17 to 25, by Ball (7). On account of the small sample, the author drew no general conclusions.

From performance on a combination of the Kent-Rosanoff word-association and the Luria tension-pressure tests, Houtchens (43) estimated the degree of mental conflict in 42 delinquent and 39 nondelinquent boys. Part of the cases were matched for age, intelligence, socioeconomic status, and school factors, but these factors had little relation to the test scores and were not so carefully considered in selecting the additional cases. The delinquents showed a bimodal curve of mental conflict scores. One of the modes coincided with that of the nondelinquents; the other one indicated greater mental conflict. Houtchens commented that those delinquents with the same degree of mental conflict as the nondelinquents may have lived in a situation where their acts were more or less approved. Kephart (47), using the same technique, found statistically significant increases in the same subjects after 6 months residence in a correctional school. A group which had been in the institution from 12 to 18 months showed a further significant increase in mean score. These differences were in the direction more characteristic of delinquents and psychoneurotics, if previous studies have given valid results.

A significant difference between delinquent and nondelinquent boys was found by Moore (62) in responses to a personal data blank which measured number of confessions made. Testing a new group of delinquents gave approximately the same median number of confessions.

Two forms of a disguised oral questionnaire of eight questions (split-half reliability of .45 and .51) were given to 100 entering state prisoners by Marchand (57). They were scored for quantity of response and emotional tone (euphoria, neutralness, and despondency). Neutral emotional level appeared most frequently (average number of neutral replies to eight questions, 3.78), euphoria slightly less (2.72), and despondency least (1.50). Parole violators were more despondent than any other group. Marchand found a correlation of +.355 between quantity of response and mental age and of +.315 between euphoria and mental age. Moreover, normal prisoners showed more responsiveness and euphoria than defectives and psychopaths (average responsiveness for normals, 19.8; for defectives, 18.2; for psychopaths, 18.5; average index of euphoria for normals, 8.6; for defectives, 5.9, and for psychopaths, 7.0). Doubt as to the validity of the test, however, is indicated by the fact that, with the exception of euphoria (+.86 and +.85), correlations were low between the questionnaire results and ratings of 56 of the subjects by two men having jurisdiction over their work and recreation.

Using a technique similar to that of Hartshorne and May in their I.E.R. Achievement Tests, Hill (37) measured the extent of cheating in 261 reformatory boys (ages 16 to 26) and 158 junior high school boys (77 rated as being behavior problem cases and 81 unusually well adjusted). Significant differences were found between the scores of the delinquents and problem boys (D/σ_D , 3.5) and between the delinquents and well-adjusted boys (6.5). The difference between the problem and well-adjusted boys

was only 1.7 times its standard error. Nearly two-thirds of the offenders did not cheat at all.

Holsope (40) suggested that inability to inhibit or unlearn behavior habits may be part of the cause for recidivism. Using mirror-drawing to test this, he found differences in line with his hypothesis between the behavior records of two groups of 40 reformatory inmates divided on the basis of their mirror-drawing ability.

Personality differences between 50 male recidivists and 50 first offenders were studied through the interview method by Tolman (90). Statistically significant differences showed the repeaters to have greater political insurgency, feelings of grievance, antagonism toward authority, hostility toward the father, reserve with both mother and father, and lack of integration with the ideal. However, both groups showed wide dispersion. No significant difference in intelligence test scores was found.

A proposed test of early indications of criminality was devised by Hawthorne (35) for use with elementary or high school students. Measuring cruelty-compassion, the test was limited to possible prediction of crimes against the person. The 31 sections each had five items to be rated in order of preference. One item in each was *a priori* considered to be sadistic, and score on the test was the sum of the "sadistic" ranks given. In a tryout, Hawthorne gave the test to 126 junior and senior high school students and to over 300 juvenile delinquents. The latter showed lower scores for compassion, the difference being significant for each sample used.

Listing all the undesirable behavior traits found in the case material of 5000 children examined at the Illinois Institute for Juvenile Research, Ackerson (2) found fewer than 300 such traits appearing in more than .5% of the cases. There were a large number of traits with incidence of less than .5%, but more than half the children had none of them. The two traits having the greatest incidence were stealing (26%) and enuresis (25%).

An attempt to estimate the seriousness of about 150 traits was made by Ackerson (4). Using as subjects 2113 white boys and 1101 white girls examined at the Institute, he correlated the incidence for each trait with (1) police arrest, (2) the total personality items, excluding the one in question, and (3) the total of conduct items, excluding the one in question. Items correlating highest with police arrest were truancy from home, stealing, bad companions, truancy from school, staying out late at night, and gang associates. Those correlating highest with personality total were dementia praecox, queeriness, depressed or unhappy manner, talking to self without apparent reason, contrariness, and question of change of personality. Traits most highly correlated with conduct-total were bad language, disturbing influence in home, "psychopathic personality," destructiveness, "annoying" girls, and truancy from home.

Work on the prediction of delinquency from personality traits has been done by Olson. In one study (66), 25 boys referred to a clinic for guidance were rated by their teachers according to the Haggerty-Wickman-Olson Behavior Schedule B. They differed significantly from the general school population in total scores on this schedule, which measures

certain mental, physical, social, and emotional traits. In another study, Olson reported an attempt to locate problem children by a nomination method (67). Elementary school teachers were asked to report the three children requiring the most attention because of undesirable conduct, to name three about whose conduct most complaints had been heard, and to rate these children on the Haggerty-Olson-Wickman Schedules A and B. The typical nominee had a percentile ranking of 90 on these ratings, but the author concluded that only half the children who would rank with the 10% of the population highest in problem-behavior tendencies would be located by this method. Court records of 3000 children, on whom personality measures were secured, were followed for a period of six years (68). Olson concluded that, in general, those children who appeared in court were ones for whom delinquency could have been predicted on the basis of the previous tests.

Healy and Bronner (36) compared delinquents with their nondelinquent siblings (105 in each group) and found from examination of records that 68 of the delinquents were reported more active than their siblings. Forty-six of the delinquents exhibited a degree of activity not exceeded by any one of the 105 siblings. In the same group, 91% of the delinquents gave evidence of deep emotional disturbances, but similar disturbances were found in only 13% of the nondelinquent siblings.

A clinical study by Childers (14) of hyperactive children led him to suggest that physical hyperactivity disappears with age and is replaced in some children, when restraints are lacking, by more specific types of behavior problem (such as stealing in boys and sex misconduct in girls).

A general conclusion from this series of studies—representative of many others—is that test results show offenders to be inferior in many aspects of personality, as illustrated by their emphasis on worry, their high scores on tests of neurotic tendency, and their retardation on tests of social maturity. Differences have also been found between the test scores of offenders of various degrees, between the two sexes, between individuals institutionalized for varying lengths of time. However, so great is the overlapping in all of these cases that no clear-cut picture of a criminal personality can be drawn. Important as this correlate undoubtedly is, its influence on crime can be thought of only in application to individual cases.

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"COLOR BLINDNESS": CURRENT TESTS AND THE SCIENTIFIC CHARTING OF CASES

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Among the unfinished tasks of psychology at the present hour is the precise charting of color capabilities in the normal and the aberrant eye. Sub- and supersensibility to blue, green, yellow, red, and mixed light stimuli in daylight and twilight vision, shifts in brightness values in aberrant cases, are of paramount importance to aviator, night flier or worker, to the fabricator or detector of camouflage, as well as to the ordinary industrialist. Yet we must look to British workers, bred in the tradition of Galton and Pearson, e.g. R. A. Houstoun (5) at the University of Glasgow, for massed results of a bulk to warrant reliable curves of distribution. What holds us back? Are there no readily applicable procedures and measures available? Or are we hidebound by antiquated terminology and outworn theories?

PSEUDO-ISOCHROMATIC TESTS

Use and Defects

Spectroscopic tests with monochromatic light are indispensable for research, but laborious and slow-moving, owing to the rapidity of retinal fatigue and need of time out for recovery. For speedier clinical color-vision tests we have too long been dependent upon Japan and Germany. The pseudo-isochromatic plates of Stilling, first published in 1876 at Strasbourgh, brought to nineteenth and twentieth editions in 1937 and 1939 by E. Hertel, of Leipzig, present a mosaic of colored spots on a white ground with a number in a confusion color, with the intent to render the latter invisible to eyes manifesting certain stock types of congenital deficiency, red-green and blue-yellow *Farbenstörungen*. The predominance of curvilinear digits, especially three's and eight's, and use of irregular contours, however, permits factors other than color sensitivity to influence the results. Faulty perception, that is, may arise from astigmatism, retinal scotomae, uncorrected myopia, resulting in blurred or broken outlines. Instructions as to speed and distance (one meter, which renders the visual image practically foveal) are usually ignored. Further, digits are readily memorizable, encouraging dissimulation.

Edridge-Green's incomplete circle test (suggested by Nagel's old—and unreliable—uni- to multicolored circles on white?) avoids one pitfall only to stumble into the other; and his seven-primary assumptions prove irksome. The French mosaic diagram test by Schaaff (1925), with its pentagonal color spots and broken circles (borrowed from Landolt?), and the accessory card-sorting test, along with Rabkin's more recent triangle figures, promise better service, but all are at present unobtainable.

In his earlier editions Stilling relied mainly on two confusion hues—dark orangish red and olive green, both perceptible presumably by the ordinary color-blind as tan or fawn, *i.e.* low chroma yellows.¹ The darkening of red to blend into a ground of gray or brown spots of varying brightnesses was adopted as the critical test for the rarer 'protanopic' type of deficiency. In the nineteenth and twentieth 34-plate editions, however, Hertel took a leaf from the Oriental, introducing two diagnostic plates with gray digits on grounds of purplish and of scarlet-red dots, respectively, matches for about 700 and 640 $m\mu$, and designed to coincide with the achromatic bands of the 'deutanopic' and 'protanopic' ('green-blind' and 'red-blind'). A dull-green digit on a ground of gray spots was also added. No high chroma RP's or BG's appear on the plates; though there is a greater variety of hues, especially in the designs for detection of B-Y blindness and various anomalies. The intricate instructions for the use of the various groups of plates are usually ignored, however, by the examiner, who relies simply on the total number of correct answers—to his own confusion.

The use of color filters to thwart the would-be dissimulator is recommended—a good suggestion, endorsed also by the British expert, Mary Collins (1). Moreover, by bleaching out certain constituent hues, color filters afford the color-capable a rough notion of the perplexities confronting the color-deficient. Since, however, two complementaries are usually depressed together in aberrant cases, even though in varying degrees, it is impossible to duplicate the resulting perception through the use of ordinary broad-band photographic filters (however misnamed 'monochromatic') or their combination. It is equally impossible to 'correct' color blind-

¹ The entire spectrum, of course, appears to the ordinary color-blind in yellows and blues of varying chromas, if the testimony both of the outer retinal zones of the normal eye and of cases of unilateral defect or retinal islands is to be trusted, though various other assumptions are still occasionally offered by three-color theorists.

ness by glasses. A missing quality cannot be restored, though a filter bleaching out or darkening it may enable the subject to detect its presence in the color field. This is true especially where a pair of complementaries is unequally depressed in color weakness. Dulling the one may serve to bring the other above the threshold.

Translation of the Stilling-Hertel directions is still inadequate, though adhering fairly closely to the descriptive term 'red-green blindness' in preference to the purely theoretical and misleading 'protanopy' and 'deutanopy' (lack of the first and of the second primaries). The plates may be used under an ordinary illuminant (though this is not recommended for the blue-yellow test design). Finally, many examiners familiar with the Ishihara report that its German prototype, with most of the plates blank to the color-deficient, is too depressing to the examinee.

Ishihara, the Tokyo expert, in his eighth edition (1939) has doubled the number of the 16 plates used in the familiar fifth edition of 1932, incorporating suggestions made by the writer in 1935 (9). There are now four examples of each variety of color combination, with both rectilinear and curvilinear digits in each group to equate legibility and at least one two-digit number to confuse the would-be dissimulator (able in the earlier edition to memorize the three critical two-digit designs).

The plates are planned for a lesser distance than the Stilling (30"), extending the visual angle of the digits over the macular and possibly an extramacular area. But the tendency of examiners, e.g. Miles (7), is to shorten or lengthen distance *ad libitum*, so that the visual image falls on differently color-sensitive zones of the retina, spans areas of varying acuity, and is subject to dimming from uncorrected myopia. Hence, the results of any two experimenters are rarely comparable—a pity, since both Istar Haupt (2) and Sybil Terman (12) have utilized for special color tests color blinds culled with the aid of the Ishihara from groups of nearly a thousand; and Miles (7) reports from a group exceeding a thousand.²

The plates of the Japanese ophthalmologist achieve a more saturated purplish red than do those of the German. (Has the Oriental the secret of the murex that gave the Romans their royal purple?) Ishihara's bluish green (500 mμ) is also of a higher chroma, though actually he uses neither BG nor RP inks, even in

² Scores secured in a group color classification test, by a procedure involving many sources of error, were obtained by Terman. Normals and those failing on one or more Ishihara plates were tested.

his trick transformation digits, relying on color contrast from background spots to produce the illusion of these hues to the normal eye. The effectiveness of this device suggests that the graying-out for color-blinds of certain colored surfaces reflecting mixed light may be due to the canceling of blue by yellow valences or processes as postulated in Hering's tetrachromatic theory.³

The fact that the chromas of the Ishihara plates, while fair, are not maximal, proved by masking off the dots with gray and comparing them with the Munsell scale, explains the complaint by clinicians and military experts that the test throws out the color-weak along with the color-blind.⁴ The present trend toward assigning the bulk of the 8 to 10% reported during the last decade as 'color-blind' to the 'color-weak' class indicates that perhaps the old Holmgren 3 to 4% of color-blind males may have been close to the truth (10). Since, however, the color-weak are virtually color-blind at a distance or in fog or rain or other unfavorable conditions, little harm and much good has probably come from rating the former as 'dangerous' defectives. There are still too many railroad accidents traceable to nonrecognition of signals.

In 1939 to 1940, when the supply of foreign tests began to run down, the writer planned a substitute pseudo-isochromatic test, utilizing a type of design more satisfactory on ocular grounds than digits, equatable, eliminating the chance of cheating. A greater range of chromas was to be employed, along with two intermediates between the R and RP of the Ishihara diagnostic plate, included at the request of U.S. examiners. For years, however, RP and BG have been stumbling blocks in the path of high-grade art reproductions and scientific printing in the best publishing houses, though there has been of late some improvement.⁵

³ A statement in the introduction that has misled many psychologists, to the effect that color-blind perceptions are determined by the greater 'brightness' of blue and yellow, is obviously a mistranslation of 'striking' or 'vivid.' There is no proof that the blue-yellow pair are 'brighter' or lighter than the red-green, in deficient as compared with normal vision, though their relatively high chroma gives them as a rule a higher attention value than other portions of the spectrum. There are, however, probably many minor deviations in brightness values in different types of eyes, as yet unexplored by science.

⁴ The white ground showing between the dots adds to the difficulty of the test by eliminating colored halos and the marginal contrast invaluable in the discrimination of low chromas.

⁵ The recent emergence in advertising of vivid magenta and verdigris or turquoise does not signify, since permanence and narrow-band stimuli are not essentials in this field.

No eastern printing-ink firm could be found to meet the requirements of the writer's test as planned, though Jensen, printing a 4-plate test in Louisville, Kentucky, in 1935, got a close approach to the Ishihara reds. Meanwhile, a 46-plate test, designed to duplicate the most useful of the Ishihara and Stilling plates (14 of the one, 31 of the other), has been released by the American Optical Company. No standardization of the set has yet been attempted to the writer's knowledge; and as the duplication of hues and chromas is not precise, there can be no reasoning from the results on the two earlier standard tests to this one.

INDIVIDUAL VARIATIONS IN COLOR DEFICIENCY AND EFFICIENCY

Devices to Measure It

Those still relying on the earlier or later editions of the Ishihara need to be cautioned against placing faith in total scores.⁶ All who have handled many cases clinically or administered special color tests to sizable groups agree on the great variations in sensitivity, whereas any printed test must be keyed to the average. These variations in hue sensitivity involve, in all probability, shifts in brightness also, upsetting the calculations of the standardized test. The most defective case ever handled by the writer, a girl retaining of the four primary hues yellow only, confounded her examiners by scoring relatively high on the Ishihara.

Three-color theorists try to absorb this variability by positing two groups of anomalous trichromats, separated out by the Nagel anomaloscope, an instrument for mixing red and green light in varying proportions to match a low chroma yellow (the 'Rayleigh equation').⁷ Critics claim, however, that the division into two groups—protanomalous and deuteranomalous (red- and green-weak)—is a forced one. Actually there exist all grades of intermediates, plottable into a symmetrical distribution curve. Further, the results from the anomaloscope are ambiguous, carrying no certainty as to whether the individual is green-weak or red-sensitive, or vice versa (5, 8).

The interpretation offered by the writer is as follows: Apparent reduction of red-sensitivity revealed by the Rayleigh equation

⁶ The scores from plates containing digits designated as 'invisible' to the normal eye require especially skeptical handling.

⁷ For description of the various wool, lantern, card, and spectroscopic tests see Hayes (4), Haupt (3), and Turner (13).

('protanopia,' 'protanomaly,' better 'scoterythrous' vision) may represent neither mere shortening of the spectrum in the red nor necessarily absence of a red receptor, but shift of the curves of sensitivity back along the spectrum, decreased red-sensitivity being compensated by increased sensitivity toward the short-wave end. So-called 'deuteranopia' may imply the reverse, a shift toward the long-wave end, with decreased sensitivity in the violet. There are indications of both cases in the findings of Houstoun, Pierce, and Hecht. Analytical tests are needed, the determination of dark-adaptability in large segments of the population, and of color thresholds at a number of points along the spectrum, the latter obtainable possibly through the use of graded and measured Munsell papers. From these a color profile for four or more hues could be charted and a single color quotient calculated for each individual. His position, quartile or decile, in a given group or on a given distribution curve could then be assigned, for vocational purposes.

Correlation with scores from analytical tests of this type is needed for each test plate of the American versions of the Ishihara or Stilling. (Meyrowitz is said to have duplicated the latter.) In any case, an examiner needs to subject each erroneously read design to special scrutiny, *e.g.* turning back to Plates 12 and 13 to ask whether any colored spots are visible in the place of a missing digit; if so, of what color? (The reply determines whether color blindness or weakness is indicated.) Further, the examiner should ascertain whether repetition and longer exposure of Plates 4 and 5 will alter the pattern or response. Is partial misreading a purely casual matter, or does it correlate with possible green- or red-green-weakness or with blue-sensitivity? (Plate numbers here refer to the fifth edition of the Ishihara.)

A study of the latter plate pattern was begun by the writer in 1935, with North Carolina rural school children in the Samarcand or pine barren region, after finding this almost the sole design they slipped on. The question remains open whether the slip was purely casual, a function of lowered red-green-sensitivity, or of hyper-blue-sensitivity correlated with their North Scotland ancestry and a congenital deficiency of protective yellow pigment in the macula lutea.

Industrialists today are taking up the problems abandoned or neglected by psychological laboratories for more modernistic and showy projects. Fifteen years ago the National Institute of Industrial Psychology in Great Britain blazed the way (11). Re-

cently the Institute of Paper Chemists, in coöperation with the American Paper and Pulp Association, devised similar matching and grading tests for their dyers, to determine super- and subnormal color discrimination, and issued a monograph reproducing curves and tables from a number of recent studies, printing a number of confusion colors and their spectral reflectance curves, and a bibliography (6).

Finally, in response to urgent requests from industry and clinicians, the Inter-Society Color Council, in 1941, set a committee working on a test of color aptitude modeled on that devised in 1926-1932 in Britain under Davies, Stephenson, and Pierce, with C. S. Myers as consultant (11). The new test material consists of paired chips in a glossy plastic, to be serially arranged or matched by the individual tested. The I.S.C.C. test is thus far limited to two R's approximating those of the diagnostic Ishihara plate, with a finely graded series of chromas ranging from middle saturation to gray, of medium brightness;^a though the British workers found blue and yellow sets also necessary for grading colorists in half a dozen vocations. If the varied scores ranging from 19 to 266 in preliminaries turn out to correlate more accurately with industrial color discrimination than the total scores of the pseudo-isochromatic tests, the longer time required for the I.S.C.C. test may be justified in the vocational laboratory.

THE HANDICAP OF OLD HARD-AND-FAST CATEGORIES OF COLOR BLINDNESS

Meanwhile, the greatest stumbling block to progress in the scientific charting of color capabilities lies in antiquated terminology—protanopia, deuteranopia, and trichromatism, along with protanomalous and deuteranomalous—reminiscent of nature's ancient errors in the way of plethiosauri and ichthyosauri. (*Psychological Abstract* reviewers have never learned to use these terms correctly.)

Survey of the early experimental literature serves at once to discredit the protodeuter antithesis—arrived at only by throwing intermediate cases in the discard. Von Kries' crystallizing out of the two types is based on an absurdly small handful of cases, with irregularities of experimental procedure possible only to one in the grip of theoretical presuppositions (8). That the relatively rare 'protanopia'—'red-blindness'—implies primarily a shortening

^a Incidentally, the test material indicates the existence of a greater number of discriminable chroma steps in the reds than has usually been reported.

of the spectrum in the long-wave end (or perhaps the shift leftward above suggested), superadded, in many cases, to dichromatism and more accurately termed 'scoterythrous' (Rivers), was suggested above. Houston reports as severe cases in the tetrachromatic or 'normal visioned' as in dichromatics (5). Deuteranopia, on the other hand, may represent a shift toward the long-wave end.

It is a fair working assumption that these shifts of sensitivity—*proto* and *deuter*—the first strongly reminiscent of the Purkinje shift, will one day be shown to correlate with excess or deficiency of rhodopsin or other absorptive pigments in the eye. Scoterythrous vision may be simply the survival of the eye adapted by nature for dim light vision, the fog or jungle eye; deuteranopia, the desert or littoral eye.

In any case, the present status of color research calls for an intensive study of thresholds for four to seven hues as above outlined; distribution curves for a thousand O's based on these thresholds or on the number of discriminable chroma steps for each hue; dark-adaptation curves; and further, the correlation of hue-sensitivity with dark-adaptability. Incidentally, along with the Greek derivatives above cited, the old term 'color blindness,' which has misled thousands, might well be swept into the discard.

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A CRITICAL NOTE ON READING

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RATE AND COMPREHENSION

Within the last 25 years educational psychologists have been teaching that a positive and, on the whole, a moderately high correlation exists between reading rate and comprehension. The average of the obtained coefficients is about .4. (In support of this see Anderson and Tinker, 3; Eurich, 7; Gray, 12; Haggerty, 13; Judd, 15; and Tinker, 21.) Comprehension as gauged characteristically by standard reading tests is a narrowly defined function. But in making application of comprehension scores we have tended to place a general construction upon them. Upon finding a positive correlation between speed scores and comprehension scores on standard reading tests, we have concluded that the fastest readers are the best and that the slowest are the poorest, without taking account of just how the comprehension score is obtained. It is a score earned on a section of a test called "reading comprehension." On the majority of reading tests this is also a speed score. The comprehension score is the number of items answered correctly within a length of time. Speed of reading the questions and speed of reading the text material to locate and determine the answers go into the score. Speed is implicated both in the speed score and in the comprehension score, perhaps in the latter about as much as in the former.

The problem has been attacked in a different way by Flanagan (8, 9, 10) by a special treatment of scores on the Coöperative Literary Comprehension Test. The test consists of several selections of literature representative of rather difficult poetic and prose styles. A number of multiple choice test items—five, on the average—accompany each selection. From this test Flanagan derived two kinds of scores: speed of comprehension and level of comprehension. The former is the total number of items correctly done minus a correction for guessing, which corresponds to the typical comprehension score as derived from standardized reading tests. The level-of-comprehension score is the average score earned on those scales which are completed. The test consists of four scales of 20 items each. By this method a perfect level-of-comprehension score is 20, and a perfect speed-of-comprehension score is 80. A pupil

who completes only one scale and answers all of the items correctly earns a perfect level-of-comprehension score. If he attempted none of the items in any of the other scales, his speed-of-comprehension score would be only 20, one-fourth of the maximum score.

This treatment of the data has some interesting possibilities for diagnostic work in reading; and comparison of his speed-of-comprehension and level-of-comprehension scores represents some improvement over the comparison of the conventional speed and comprehension scores as a method of determining the relationship between speed and comprehension in reading. But the method also has some limitations owing to the fact that the two scores have a good deal in common. Just as in the conventional type of procedure, speed of reading is a factor common to both the rate score and the comprehension score, so here comprehension is common to both scores. For purposes of studying the relationship between rate and comprehension it might be more desirable to employ two such tests, using one for purposes of deriving a rate-of-comprehension score and the other for deriving the level-of-comprehension score.

Flanagan reports a correlation of .77 between speed-of-comprehension and level-of-comprehension scores (9) and a correlation of .17 between rate of reading as indicated by the last item attempted within a time limit and the level-of-comprehension score on the Coöperative Literary Comprehension Test (10). This large discrepancy between the two coefficients may be taken to mean that the speed-of-comprehension score is to a considerable extent the same measure as the level-of-comprehension score. The correction for errors is common to both. The best expression of the relationship between speed of reading and comprehension in Flanagan's articles seems to be $r = .17$, the obtained coefficient between speed of reading and level of comprehension. His level-of-comprehension score represents an important contribution to methodology in that it eliminates the speed factor involved in conventional comprehension scores. Moreover, the low coefficient obtained when level-of-comprehension scores is put in relationship with rate scores substantiates the claim made above to the effect that the published coefficients between rate and comprehension are spuriously high.

By any intelligent construction of the term, rate of reading means the rate at which a person reads with understanding. No one is seriously interested, except for some experimental purpose, in ascertaining that rate at which isolated words may be perceived.

Rate of reading, then, really means rate of comprehension. It is well known that the rate of a given person varies with the level of comprehension to which he aspires and with the character of the reading matter. It is also recognized that mature readers vary enormously one from another in rate of reading a standard passage. Jorgensen (14) reported an S.D. of 51.7 words per minute for high school seniors on standard reading material, the mean being 260 words per minute. Booker (4) obtained an average rate of 242 words per minute for 664 college freshmen, the middle two-thirds falling between 180 and 300 words per minute. Undoubtedly the reading was done in both instances at varying levels of comprehension. It is not known, of course, what the variability would have been had all of the subjects aspired to the same level of comprehension. Probably it would still have been enormous.

There are persons who are identifiable as fast and slow readers, with all gradations in between. The question at issue is whether those who read at a rapid rate understand more, learn more, get more out of a reading, than do those who read at a slow or moderate rate. It is recognized that there is no one fixed rate of reading that characterizes a person; but there are those who characteristically read fast, moderately fast, moderately slow, and so on.

This paper advocates the reclamation of an abandoned method of attacking the problem at hand. What we really wish to know is the relationship between the speed at which a person reads and what he gets out of a reading—what he learns. In educational psychology we have interpreted the obtained coefficients between rate and comprehension scores as being an expression of such a relationship. For reasons stated above, this is untenable. The fast reader may actually learn more in a single reading than does the slow reader, but positive correlations between the prevailing rate and comprehension scores do not prove it.

If the crux of the problem is the relationship between speed of reading and learning, it can be attacked more profitably by the use of learning scores. King utilized this procedure in two investigations published in 1916 and 1917 (17, 18), and Abell used it in 1894 (1). Both investigators found the two variables to be virtually unrelated. Any of the tests now used for the purpose of assessing learning are suitable for this purpose. The only requirement peculiar to their use in an investigation of this kind is that a time limit not be imposed. Perhaps ideally the rate at which the subjects normally read when they study or are otherwise set to apprehend

the content of the reading matter should be determined by independent means. Each subject then should be required to read at this predetermined rate in the experimental situation. This procedure has been criticized on the ground that the score obtained is a memory score. Perhaps here again we have been misled by the use of a term. Any act of learning requires memory, and any measure of learning is to some extent a measure of memory. Nor is this situation peculiar to investigations of learning. Almost every test involves memory to some extent. In a reading test the pupil must remember the answer long enough to record it, even if he holds his finger on the line in the text that contains the answer.

There is reason to believe that the pupil who has the best understanding can give a moment later the best account of what he sees and hears or otherwise apprehends. The pupil who can give the best account a moment later can also give the best account a day or a week later (6, 11, 19, 20). After all, good comprehension is of no educational value save for the fact that it means that a good response can be made afterward.

FIXATIONS IN READING

Incidentally, a word may be added concerning another matter, namely: an unjustified generalization about the number of fixations made per line by the average mature reader. This is customarily reported to be 5 to 6, the value obtained by Buswell (5). It appears that 8 to 10 is more nearly correct. Buswell's data are correct for his conditions, which is as much as can be said of any data; but his conditions were not typical. His reading matter was set in a $3\frac{1}{2}$ -inch (21-pica) line. This is about a half-inch shorter than the minimum used in high school and collegiate texts. Moreover, Buswell's mature readers read second-grade material. It is known that the number of fixations varies with the difficulty of the material. Judd and Buswell (16) obtained an average of 6.0 fixations per $3\frac{1}{2}$ -inch line (3.5 *M*'s or pica units per fixation) for very easy reading matter, with fifth-grade pupils, and 7.8 fixations per line (2.7 *M*'s per fixation) for difficult matter. Anderson (2) obtained an average of 3.40 *M*'s per fixation by good readers (college students) for primer material and of 2.66 for difficult collegiate text, and an average of 2.92 *M*'s per fixation by good readers and of 2.68 by poor readers for moderately difficult text. Converting the foregoing into number of fixations per 24- and 28-pica line we get the following:

Subjects	Material	Av. No. Fixations per Line	
		24-pica	28-pica
Buswell's, high school and college	Second grade	6.2	7.2
Buswell and Judd's Fifth grade	Very easy	6.9	8.0
Fifth grade	Difficult	8.9	10.4
Anderson's, college Poor readers	College text, moder- ately difficult	8.9	10.5
Good readers	College text, moder- ately difficult	8.2	9.6

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PSYCHOLOGY AND THE WAR

The work which American psychologists are doing in the war effort is more extensive and important than is often realized. Many who are not in immediate touch with governmental affairs have no way of knowing what is being done by psychologists, and the information available to those who are participating, whether in the armed services or as civilians, is inevitably limited. True, a great deal of psychological work in the service of the country is wisely regarded as confidential information, but there is much which can and should be known. A list of the psychologists thus engaged is an example of this information.

To provide a medium for the publication of such information, and of announcements which government officials would like to call to the attention of psychologists, the *Psychological Bulletin* will devote a special section to "Psychology and the War." The special section may not appear in each issue, but will appear as often as the available material warrants. As soon as possible an editor who is closely in touch with the work of psychologists in the war will be selected for this section. Meantime, the following announcement from the Office of the Chief of the Air Corps, War Department, marks the initiation of the section.

Plans are being made for the collection and publication of a roster of psychologists in government service. Every psychologist in such service, whether in the armed services or as a civilian, is asked to reply promptly to the request for his address and official designation which will presently be sent out. It is to be expected that new appointments and changes of address will be frequent, and the *Bulletin* will publish supplements to the roster as often as is possible and justifiable. Psychologists are asked, therefore, to notify the editor of such changes in order that the *Bulletin* may maintain an up-to-date record of psychologists who are officially in government war service. This and the other information likely to be published in the section on "Psychology and the War" will have historical importance as well as current significance.

JOHN A. MCGEOCH.

MEMORANDUM REGARDING AREAS OF PSYCHOLOGICAL SERVICE IN THE AIR CORPS

Discussion:

The Air Corps has established a number of Psychological Research Units. These units, under a central office, are engaged in

the development and administration of individual and group tests to be used in the selection and classification of men for the aircrew. The program involves research on the various mental, motor, perceptual, and personality factors contributing to success in military aviation.

In the School of Aviation Medicine a program of research is being conducted on special psychological problems related to aviation medicine.

Under the Technical Training Commands there is a program for the development and administration of classification tests for the many technical and maintenance duties in the Air Corps.

Commissioned Personnel:

A few psychologists with special qualifications are being commissioned in the Air Corps and assigned to duty in the Psychological Research Sections. Future policy with respect to the commissioning of men of draft age cannot be stated. It is probable that few commissions will be granted to men of draft age unless they first attend Officer Candidate Schools.

Enlisted Personnel:

A fairly large number of enlisted men who are qualified under the specifications for Psychological Assistant as outlined in Army Regulations are being assigned to Psychological Research Units in the Air Corps. The requirements for Psychological Assistant specify that the individual "must have had experience in using standard apparatus in a psychological laboratory, or in designing apparatus for psychological research, or in using or constructing standard psychological tests. Such individuals ordinarily will have had some graduate training in psychology or in mental measurement, but sufficient training in a well-equipped laboratory will qualify an individual even though he may not have completed all work for a bachelor's degree. They must have had psychology or testing as a major subject and completed at least 18 semester-hours or 27 quarter-hours in these fields."

The advisable procedure for civilians to follow if they wish to enlist with the Air Corps for service in Psychological Research Units is outlined below:

(a) Write to the Chief of the Air Corps, Attention: Medical Division, War Department, Washington, D. C., stating in full your education and experience. Specify all training in psychology and

testing. Specify (1) name in full, (2) date and place of birth, (3) local board number and registration serial number.

(b) If the individual is acceptable as a Psychological Assistant, he will be sent a letter indicating his acceptability.

If the above procedure is followed, it will enable the officers in the Army Air Forces to initiate action for obtaining the assignment of qualified individuals to psychological duty. The assignment of enlisted men to Psychological Research Units in no way prejudices their chances of later consideration for admission to Officer Candidate School.

Civilian Personnel:

A few psychologists, both men and women, hold Civil Service positions in the Office of the Chief of the Air Corps, the School of Aviation Medicine, the Air Corps Technical Training Command, and at other stations. It is anticipated that vacancies in various grades in these civilian positions will occur from time to time. Inquiries concerning such positions should be similar to those mentioned under Enlisted Personnel.

BOOK REVIEWS

HARTMANN, G. W. Educational psychology. New York: American Book, 1941. Pp. xvi+552.

The contents of this volume overlap general psychology only to a negligible degree, a feature which will bring commendation from many instructors. Not so commendable, however, is the author's refusal to take cognizance of research in this field unless it has "made a difference" to him personally.

The author claims that a "consistent, coherent, and noncontradictory educational psychology can be achieved only by adhering to a comprehensive theoretical system that does justice to the observed reality." The theoretical system followed is apparently configurational, but not rigidly so. However, the author suggests that his "system" may be socially rather than psychologically oriented, for he says in this connection that "educational psychology has now unblushingly begun to place itself at the service of the cause of social reform instead of extending a tradition of remote reserve from the affairs of a harassed populace" (p. xi). The editor lends to the systematic confusion by claiming that the system expressed here hinges upon the viewpoint that "all who are given the opportunity, may grow into their full stature." If it were not for the author's systematic aspirations, as opposed to eclecticism, these questions as to what the system really is might be overlooked. When one forgets the system and examines the book itself, he finds it, except in a few instances, a very stimulating and praiseworthy achievement.

There are three major divisions. The first of these, "The Psychological Approach to Educational Problems," comprises five chapters (138 pages). The chapters, in order, deal with pupil needs, teacher's values, the human organism, the life cycle, and the field of educational psychology. Children's needs are seen as having a pivotal place in education. Teacher's values are considered in the light of Spranger's types. The prestige of the teaching profession, as indicated by the author's own research, is also discussed. The basic pattern of growth is seen to be from undifferentiated to differentiated. A very doubtful use of analogy here is an attempt to link the trend of physiological development with that of visual perception in such a manner as to imply that cognitive growth recapitulates organic growth. Thus there exists "an underlying kinship between the process by which our organs emerged from an organless entity and the manner in which we become oriented in the visual world" (p. 51). One learns also that "there are no psychological events before a living creature develops and they cannot be found after he dies," that "the unborn child exhibits surprisingly few responses that can be turned to educational purposes," and that "man—before he became 'human'—was a vertebrate."

For what purports to be a systematic presentation, the chapter on the field of educational psychology is eclectic in the extreme. Selected abstracts from *Psychological Abstracts* are reprinted and discussed, the aim being to acquaint students with the nature of education problems and

research. Over one-half of this chapter describes the topological interpretation of such things as preparation for a teaching career, getting correct answers, and overcoming distaste for cod-liver oil. Without further enlightenment, a student may gather that educational psychology is a mixture of many things, but primarily topology.

The second division of the book (302 pages) is concerned with *improvement* of intelligence, purposive behavior, emotional life, thinking and reasoning, learning, originality and creativity, character and personality, and social behavior and group relations. Emphasis upon improvement rather than upon these processes as they are treated in general psychology is quite apropos in a book on educational psychology. Of the chapters in this division, that on intelligence is most provocative, for the author takes the stand that intelligence may be improved not only by eugenics but by eugenics as well. A larger amount of literature than in any other chapter of the book is considered. In discussing the nursery school researches, the author takes the stand that "even if these were unanimous in indicating no increase—which they are not—this would not mean that such an increase was forever beyond the bounds of possibility; it would mean that we had not discovered the control of those forces which give to phenomena the properties they have and which make their very being possible in the first instance" (p. 187).

Pupil purposes, functional autonomy, and topology are stressed in the chapter on purpose. The discussion of emotional life has the theme that personal happiness is the goal of education. Principles for the improvement of thinking and reasoning are presented. The chapter on learning is characterized by emphasis upon achievement of insight. Despite much information to the contrary, none of which is discussed, the whole method is unqualifiedly recommended, apparently on the ground that it fits gestalt theory. In a chapter omitting much important research, it is doubtful whether the seven pages devoted to reprinting the author's items on the affective tone of different areas of educational psychology are either relevant or justifiable on other grounds. If this material required consideration, a few sample statements would have sufficed.

The discussion of originality and creativity is notable especially for a discussion of intuition. However, dubious analogy is again involved. The tendency of formal education to be "heavily overweighted on the side of absorption and gravely unbalanced on the side of self-planned performance" is regarded as "a rejection of the lesson presumably given by the structure of the organism itself which maintains a better equilibrium between the receptor and effector segments of the living system" (p. 371). The chapter on character and personality stresses the "theme-song" concept and "a design for personal living." The final chapter of this section deals primarily with leadership and cooperation.

The third large division of the book (86 pages) presents the application of psychology to the teaching of specific subjects at the elementary, high school, college, and adult levels. Emphasized throughout these chapters is the aim of achieving understanding or insight rather than mere rote knowledge. There is very little reference to the work of experimental educationalists in this area.

As one may gather from what has been said, this is an unusually provocative volume. As a text, it will doubtless need supplementing with research material. However, its shortcomings from the standpoint of research content are more than compensated for by its lively treatment of vital educational issues as seen through the eyes of a socially-oriented educational psychologist. The stimulating value of the book is furthered by the addition of excellent questions at the end of each chapter. There is a supplementary bibliography, primarily composed of book references, and a glossary. The general format is highly attractive.

NORMAN L. MUNN.

Vanderbilt University.

BUROS, O. K. (Ed.) *The second yearbook of research and statistical methodology.* Highland Park, N. J.: Gryphon Press, 1941. Pp. xx + 383.

The second yearbook of research and statistical methodology is a compilation of 1652 excerpted book reviews which appeared in various journals between January 1, 1933, and June 1, 1941. The reviews of the 359 books and monographs listed are taken from 281 English-language journals in the fields of agriculture, anthropology, astronomy, biology, business and economics, chemistry, education, engineering, eugenics, forestry, health and hygiene, history, insurance, library, literary and general publications, mathematics, medicine, personnel, philosophy, physics, political science, psychiatry, psychology, religion, science (general), social science (general), sociology, and statistics. The usual bibliographical data are given for each of the books and excerpts of reviews. With very few exceptions, the name of each reviewer is listed. In addition to the reviews, there is a periodical directory and index, a publishers' directory and index, an index of titles, an index of names, and a classified index to the books reviewed.

The editor lists eleven objectives to be achieved by the publication of this yearbook series. In the opinion of the present reviewer these can be condensed to three. The first is that of helping students and teachers keep abreast of the times in research and statistical methodology and making them more keenly aware of the inadequacy of much of what they are teaching. In the selection of textbooks this information would be particularly helpful. A second significant objective is to encourage a higher quality of work on the part of those who publish books in this field. Through an examination of reviews written for books on related topics, a prospective author can profit from the mistakes of others as they have been pointed out by various reviewers. A third purpose is to stimulate reviewers to take their responsibilities more seriously, writing more critical reviews where they are competent to do so and declining to write reviews of books which they are not qualified to evaluate.

There can be no disagreement with any of the objectives listed. Whether they will be achieved by publishing reviews in yearbook form is another question. At present many books are adopted for class use before the reviews appear in the journals and certainly long before they can be compiled in a yearbook. As a result, it is doubtful whether a project of this nature will have much immediate effect upon the textbook problem.

Because of the brevity of many reviews, the wide differences of opinion which they represent, and the nonevaluative character of some, it is a bit optimistic to hope that much educating can be accomplished by merely bringing the reviews together in convenient form, granted that only the best are selected. In any event, such an educational process will proceed very slowly.

The realization of the second and third objectives appears more hopeful. An author writing in the field of statistics and scientific methodology and interested in the improvement of his manuscript is likely to consult the *Yearbook* for helpful suggestions. To search for them in the original in a wide variety of journals would be too arduous a task. The same could be said for book reviewers. Indeed, to this reviewer it seems that the third objective is the more likely to be achieved. In later issues of the *Yearbook* it might be advisable to include a section on the subject of book reviews. For example, suggestions could be made regarding the amount of space which should be devoted to description and evaluation, criteria for evaluation, and style of presentation. If the improvement of reviews could be achieved through such means, the publication of this yearbook series would be well worth while.

A commendable improvement proposed by the editor for the yearbook series is the publication of original criticisms of articles and papers in the periodical literature. The need for such criticisms is clear, but, in view of the limitations in funds and machinery which would likely be encountered, it would seem best to confine the series to book reviews, at least for the present.

The present *Yearbook* is an ambitious undertaking and one of which the editor may well be proud. In the fields of psychology and education, the excerpts of reviews as presented are of high quality. The only limiting factor is the original quality of the reviews themselves. It is a fair presumption that reviews in other fields are equally good. Advanced students of statistics, progressive college teachers, and research workers will find this book useful and will welcome future publications in the series.

DEWEY B. STUIT.

University of Iowa.

CANTRIL, H. *The psychology of social movements*. New York: Wiley, 1941. Pp. xv + 274.

Cantril has addressed his book to persons who feel a lack of understanding of social movements that are rooted in crises even after reading books by historians, able journalists, and correspondents, or after listening to commentators. He assumes that these persons want to know what makes men follow an untried leader, how the social environment makes them suggestible, and what people are thinking about and hoping for when caught in the troubled events of today. Psychologists, in particular, he challenges to evaluate social movements and actually to influence directly the course of human affairs. In addition to providing meaning to alert inquirers into specified social movements, Cantril hopes to give them a conceptual framework which will explain any social movement.

The aim of the book is most ambitious. If the reader will pause to

reflect upon it, several implications will stand out clearly. One implication is that it is possible to provide a conceptual framework to explain all social movements—a framework that can be applied successfully by anyone who comprehends the basic principles elaborated within this book. Another is that psychologists can and should become interpreters of social events not directly investigated by them but reported to them by historians, commentators, biographers, or news reporters. To some, this appeal will be alluring. In accepting it, they will leap beyond data teased out by research, invest themselves with authority in consequence of their training, and become the leaders in a real democracy.

Three introductory chapters introduce and define the basic explanatory concepts. These chapters discuss "The Individual's Mental Context"; "Motivation in Social Life"; and "The Individual's Pursuit of Meaning."

Chapter I should be useful to beginning students in social psychology who need to understand how a culture is introcepted. Each individual's mental context presents some orderliness partly because he is surrounded by social products called manners, customs, and institutions. When standardized, these are called social norms. In judging these norms, the members of society have derived social values. The author stresses the need of realizing that norms and social values exist before the individual can be aware of them. They can be experienced by direct contact, or secondhand as the ideas and behavior of other people. An individual, therefore, has passed on to him certain assumptions, as, for example, notions of right and wrong and of superior and inferior persons. His mental context is said to have three characteristics. Standards of judgment are forged out of the notions of good and bad, or out of the assumptions; frames of reference, or generalized points of view, issue from the notions and the standards of judgment; and attitudes, or definite interpretations of specific situations, are derived from general frames of reference. Cantril also discusses, in this first chapter, social conditions giving rise to individual differences in mental context and proceeds to show that these differences are selective agents in the formation of new frames of reference.

Chapter II deals sketchily with functional autonomy, the development of the ego, self-regard and its aspects of status and self-integrity, and the ego drive. Because of the rich materials ignored, this chapter fails signally to do justice to the importance of motivation in social movements. The author has substituted his particular classification of drives for other motives which he thinks are too inflexible to account for the variety of goals sought by human beings, or which he believes are too indirect in their operation to account for directed behavior. Apparently the ghosts of "instincts" haunt some psychologists; or can it be that a host of motives or needs defy adequate interpretation within the confines of a short chapter? Might not social movements within the conquered nations of Europe present different features if, instead of food hunger, the people enjoyed adequate nutrition?

The first part of Chapter III attempts to show why an individual's experience is organized. Three explanations are offered. Certain stimuli are patterned and so are perceived directly as an organization; social

stimuli are interpreted by frames of reference; and some social situations are chaotic and annoying to the individual so that he feels impelled to seek meaning. Suggestion and suggestibility are discussed ably in the latter half of the chapter. Factors favoring suggestibility, such as age, sex, fatigue, prestige, and majority opinion, are regarded as limiting conditions. They must be considered along with the mental context of the individual.

Part II of the book is an analysis of five social movements. Two chapters are devoted to a discussion of the Nazi Party and one each to the "Lynching Mob"; the "Kingdom of Father Divine"; the "Oxford Group"; and the "Townsend Plan." Generally, the author traces the origin and development of these movements and then applies the explanatory concepts elaborated in Part I.

Cantril has given us a challenging book written vigorously. The short Part I probably will be more useful to students of social psychology, and Part II will be more interesting. The author has been obliged to roam far from technical psychological inquiries to secure information. Serious readers may remain unsatisfied or still seeking meaning out of chaos. If frames of reference enable men to "place" and interpret a variety of stimuli, are not the sources cited in this book ever biased by similar frames of reference? Is a psychologist, in consequence of his training, able to allow for errors and inadequacies in the writings of men who are not required to check their observations rigidly? Even under relatively simple conditions, variables are hard to control and hypotheses are often relegated to the limbo of human errors when interrelationships are discovered. Can we modestly assume that data based upon uncontrolled conditions warrant that degree of confidence implied in this plan to provide a conceptual framework which will explain any social movement?

CHARLES BIRD.

University of Minnesota.

MCKINNEY, F. *Psychology of personal adjustment: students' introduction to mental hygiene.* New York: Wiley, 1941. Pp. xi+636.

"This book was written to meet the need for a basic psychological text which frankly attacks the problems of the student that are most vital to his personal adjustment and offers him factual material on these problems. It is not a text in general psychology . . ." (p. vii). In line with this general objective the author has sifted out from a great mass of published experiments and experiences those which bear directly upon psychological problems facing college students. The text is to be used in a freshman or sophomore course designed to assist the students directly with their own personal adjustments, as opposed to the learning of certain facts and principles of psychology which now are required in a sequence of professional training. In a sense this book is prepared for the orientation classes offered to freshmen in many colleges.

The materials are organized in sixteen chapters around such major adjustment problems as the following: analysis and readjustment of personality; study techniques and methods of learning curriculum materials in college; personal efficiency in the use of time and money; physical hygiene with regard to the preparation of classroom materials; the choice

of a vocation, and the relationship of aptitudes and interests to such choices; social adjustment including leadership and popularity, personal appearance and habits, the making of friendships, participation in extra-curricular activities including fraternities and sororities; adjustment to social conventions and other social institutions in college, particularly sex adjustment and premarital adjustments; emotional stability and maturity including crushes, conflicts, emotional effusiveness, fears and worries, inferiority feelings, and the development of a philosophy of life.

In the last chapter the author discusses in general terms the adjusted personality which he defines in these terms: "... if you meet your needs with resources available in your environment" (p. 540). And again: "The man who is motivated, striving, and zestful in a number of directions which are compatible and within the extent of his capacities reaches optimal adjustment" (p. 544).

In Chapters II and III the author discusses methods of analyzing personality by means of preinterview blanks (printed in the appendix) listing achievements, activities, health, interests, and plans, home life, family, school history, etc.; self- and acquaintances' ratings; past experiences as the cause of adjustment problems; unsatisfactory motives and their effects on behavior; reactions to conflicts such as rationalization, projection, regression, defense mechanisms, fantasy, compensation, and repression. Personality readjustment, the author states, consists of changes in specific habits through understanding the symptoms and problems, finding the cause, reorganizing the motivation, morale building, assigning new motives, eliminating undesirable habits, and building other positive habits.

The author's style is personal without being preachy. Examples are given from college life, and illustrative cases depicting the adjustment problems of students highlight the principles stressed by the author. Significant and relevant research studies are carefully interwoven with the expository material, and the principles and generalizations are made explicit for the student. References are given at the end of each chapter in the order of reference in the text itself and are not alphabetized. This arrangement may prove to be confusing to the reader. The author's emphasis is on procedures for personal counseling with adjustment problems of students rather than upon an exposition of psychological generalizations and facts. He is to be commended for the minimum of preaching of the mental hygiene type. Only certain precepts of the common-sense variety are given on pages 548 and 549, summarizing the preceding content in the student's own language. To the reviewer this book more closely approximates the ideal counseling book for undergraduates than the numerous other available texts.

E. G. WILLIAMSON.

University of Minnesota.

WHITE, W. The psychology of dealing with people: serving the need of a feeling of personal worth. (New ed., completely rev. and reset.) New York: Macmillan, 1941. Pp. xvii + 268.

For the benefit of readers who may be unfamiliar with the former (1936) edition of this book, it may be explained that it belongs in the

same category with such books as Webb and Morgan's *Strategy in handling people* and Overstreet's *Influencing human behavior*. Its purpose is realistic and immediate. It is in no sense a systematic treatise on psychology. It is an application of certain principles of interpersonal adjustment to the need for a feeling of personal worth. It suggests many practical methods of recognizing this need in oneself and in others and of ministering to it in such a way as to facilitate human relationships.

Close comparison of the two editions shows that many alterations in organization have resulted in a better-knit presentation without any fundamental changes in approach. However, the changes are more than mere editorial corrections, involving as they do a general tightening up of the outline of the book, condensation of chapters, removal of long lists, fewer and better-integrated illustrative materials, and more adequate discussion of both outline and illustrations. Such new material as has been added is so homogeneous with the previous plan that it is not evident unless one compares the two editions almost page for page. The new edition seems, as a result of these changes, to be much better integrated and more effectively subordinated to its outline than before.

The page format is more pleasing than in the earlier edition, as well as easier on the eyes. The use of larger type for the headings, and the centering of such material on the page, causes the outline to stand out more clearly. The vocabulary is modernized, and more acceptable phrasings are substituted in many instances for less pleasing ones. Omission of serial numbers or letters in listing items preserves the conversational tone of the book and seems more in keeping with the purpose of the discussion.

Although the number of illustrative items has been reduced, the new edition still contains more poetry than seems entirely warranted by the context. The discussion of research material is more to the point than was the case in the earlier edition, where it seemed to this reviewer that the author depended too much on mere inclusion of material that had appealed to him personally. Unfortunately, many persons tend to become so preoccupied with illustrations that they forget that the author was using them to make a point. Research data, however, tend to strengthen the principles set forth.

On page 34 the author points out: "By saying that *we* should do a certain thing, rather than that the other person should do it, a speaker . . . puts himself on a common basis with him [the hearer] and so avoids becoming antagonizing." On page 248, as well as in several earlier sections, however, the author reverts completely to speaking in the first person, even to the last sentence of the book: "The methods of dealing with people that I have presented are fundamental." In other words, in this and other places throughout the book the text does not quite exemplify the principles of human contact elsewhere set forth in the discussion.

Self-testing exercises that ask the reader to check a certain number of items as correct, without giving somewhere a key to which ones of the list are correct, may lead to much futile discussion. The instruction to write in the margin the number of chapters in which given topics have been discussed seems a rather weak form of review and one which, if

accomplished, would lead only to a sort of indexing of a particular book rather than to adequate grasp of principles. After all, there is nothing particularly sacred about the outline employed by any one textbook.

It has seemed to this reviewer that the best that one can do with the form of presentation selected by the author is to make it a kind of encyclopedic expansion of an outline rather than an integrated discussion of principles. A categorical list of dos and don'ts, even accompanied by sprightly illustrations, sooner or later becomes very dull reading and difficult to teach. And yet, many persons could doubtless be greatly improved by incorporating into their behavior a large number of the forms of response here set forth.

This book should be very useful as a reference work. It has gathered together a considerable number of the suggestions that might be made on the problem of increasing one's own feeling of personal worth and that of others. The title, *The psychology of dealing with people*, covers more territory than the presentation does. It seems that the subtitle indicates more truly what the scope of the discussion is—*Serving the need for a feeling of personal worth*.

EMILY L. STOGDILL.

Ohio State University.

TRAVIS, L. E., & BARUCH, D. W. *Personal problems of everyday life: practical aspects of mental hygiene.* (Student's ed.) New York: Appleton-Century, 1941. Pp. xv+421.

The authors present their theme in the first chapter: Many troubles are unnecessary, and "inner strength" and self-understanding can aid us to meet them. In the first of three parts are chapters on symptoms, motives, adjustive processes, and analytical procedures. The second part discusses childhood and adolescent problems, marital relationships, work and play, and physical handicaps. The last part is devoted to a few therapeutic suggestions and good advice on the need for, and selection of, professional assistance.

As a book which attempts to give laymen some insight into their problems, it is good. The authors emphasize the fact that primary motives and cumulative childhood experiences are basic in symptom causation. They explain fundamental adjustive reactions clearly and simply. They write entertainingly, weave a variety of concisely presented cases into the discourse, and emphasize the use of penetrating self-understanding rather than of a set of tricks.

The authors, it would seem, intend the book primarily for college students. The reviewer's copy is a "student edition" and the preface states: "It is written so that the college student will not have to waste time with technical terminology necessitating a lot of looking up of new words and definitions."

As a text for college students' consumption, the book must be evaluated most critically. Most psychologists feel a responsibility to train their students in the appreciation of precise definitions, in the careful derivation of generalization from systematically collected empirical data,

and in the analysis and the unification of these concepts with each other in a logical system.

College students should find the book a contrast to their texts in the other sciences, if it be used as a text. The chapter headings are metaphoric and slangy, as, for example, "Life's Drama—The Curtain Rises"; "What We Are After"; "Behind the Scenes." The annotated bibliography of over 150 selected titles includes references from fiction, *Parents' Magazine*, popular books, articles from psychological journals, and technical reviews of periodical literature. The chapters are unevenly documented. Some contain no references to the literature, while others are well annotated. The variation in the number of references to systematic studies in the text does not seem to be related to the number or quality of journal articles on the subject which exist in the literature.

The authors generalize freely. For example, we are told: "When a child—or, for that matter an adult—bites his nails he may symbolically be biting someone else"; also, "The child who is not given love early finds it hard to give love later"; "Usually, when a girl is first noticed by a boy she craves to 'go steady'"; "As a baby he (the adolescent) wanted to be messy. He still unconsciously wants to be messy." The authors do not inform the reader by implication or straightforward statement which of their generalizations hold for specific or limited cases, which are hypotheses that await concrete evidence, and which, if any, emanate from empirical researches.

Despite the fact that the first few pages are devoted to the concept of the individuality of personality, many readers will use the given stock explanations for human behavior and view their associates in terms of common patterns, without consideration of individual variations. The student is not warned that a symptom which results from a given cause in a specific case cannot always be interpreted in the same manner. The book gives nomothetic biases which Dr. Travis and Dr. Baruch, with their clinical perspective, would not indorse.

The discussions of temper displays, jealousy, and fears are treated without apparent benefit of the many recent systematic studies. The authors do not even hint that their own discussions have been consciously oversimplified and that all of these phenomena are dependent upon many factors. The authors are to be praised for delving beyond symptoms to find the causes of these problems.

The student may conclude that all problems are as heavily laden with unconscious reactions as are those in the cases presented. He is not told that there seem to exist among children many conditioned fears, anger displays, and reading difficulties in which the unconscious conflicts are apparently minimal.

There is a paucity of specific information and suggestions in the book, even in portions in which such facts might have therapeutic or preventive value, as the sections dealing with sex education and vocational selection, and self-help. One of the few exceptions to this general treatment of topics is the discussion of the details of coitus in marriage, which is known to be a less important factor in marital happiness in nonclinical groups.

The acquisition of new habits is minimized in favor of insight, as in many books on this subject. The relationship of self-understanding to "inner strength" is not greatly emphasized. The authors recapitulate very seldom, considering the manner in which their free style carries one through the book without arrests.

FRED MCKINNEY.

University of Missouri.

STREET, R. F. *Children in a world of conflict.* Boston: Christopher, 1941. Pp. 304.

The author's purpose in writing this book, as stated in his introduction, is to "examine some of the ways in which children respond to environments which are confusing and frequently hostile, and to indicate what might be done to help them make the most adequate adjustments." He attempts to fulfill this purpose in eleven chapters, the first five of which present some of the more recent findings on child development and mental hygiene, whereas the remaining six deal with the organization of the school, teacher-pupil relationships, and the responsibilities that the teacher and the community have toward the child.

Chapter I, "Security and Loyalty," emphasizes that the child's security depends upon his ability to deal with a threatening environment and upon his usefulness to the group. His loyalty in turn depends upon security. Chapter II, "Variations and Adaptations," is a brief discussion of individual differences in adjustment. The next three chapters deal with growth: "Growth and Maturity"; "Growth and Behavior"; "Growth and Learning." Chapter VI, "The School and the World of Conflict," approaches the problems suggested by the title of this book more closely than any of the other chapters. "The School Organization," Chapter VII, is an outstanding chapter that gives the layman a better appreciation of the modern school and its purposes. The next three chapters—"Knowing the Child"; "Teacher-Pupil Relationships"; and "The Teacher at Work"—deal with school problems, techniques, procedures, and goals. The last chapter, "Guidance and the Community," points out the responsibilities of the average adult and parent in the matter of child guidance.

The author's style is simple, direct, conversational, and interesting. The principles and problems discussed are illustrated with interesting, although entirely fictitious, case histories which constitute 20% of the entire book. These illustrations usually appear near the end of the chapter and include accounts of both adjusted and maladjusted children. As to typography, the print is large, the pages small, and the spacing ample—particularly between chapters. Hence the book can be read very rapidly. Each chapter is preceded by a pertinent question that is enlarged upon in the succeeding pages. At the end of the book there is a list of fifteen suggested readings and a short index.

The title of this book suggests a number of problems that result from conflicting tendencies in our society, such as: aggression and coöperation, family unity and emancipation from the family, dominance and sympathy, etc. Further, the title suggests the present world conflict and its impact on children here and abroad. One would like to read more about

war propaganda among children, the uncertainty and insecurity generated by the war and its relationships to children's problems, and even about the effects of foster-homes-for-the-duration and evacuations on children. Unfortunately, most of these topics were touched on very lightly or not at all. Inclusion of some or all of them would have increased the value of the book, particularly since it was written primarily for the layman and parent.

GEORGE J. DUDYCHA.

Ripon College.

BABCOCK, H. Time and the mind: personal tempo—the key to normal and pathological mental conditions. Cambridge, Mass.: Sci-Art, 1941. Pp. 304.

This book might well be considered as two books.

"Book I" consists of the presentation by the author of a revision of her well-known test battery, this time worked out in collaboration with L. Levy. In the present revision there are a greater number of tests than in the original battery, and all tests designed to measure "mental efficiency" are timed or are affected by a time factor. Some tests which were included in the original battery have been discarded because of poor discriminative value. There are thirty-one tests in all, in addition to the Terman Vocabulary Test. Twenty-four of these tests make up the efficiency test. Three tests (General Information, Pronunciation, Time Orientation), which are not averaged with total score, are given for the light they throw on an individual's orientation and "psycho-motor-lingual" loss. Four other tests (Opposites, Sentence Completion, Analogies, Number Completion), which are not averaged with the efficiency score, are utilized to obtain an estimate of an individual's abstract-verbal ability.

The revised test battery and the author's discussion of its applications will be of considerable interest not only to psychologists who are working with neurological and psychiatric material but also to those who are engaged in educational work and in vocational and personal counseling.

"Book II" consists of the presentation of the author's opinions concerning a variety of psychological topics. Some of the section headings are: "Omissions in the Education of Academic Psychologists"; "Lack of Breadth in the Education of Leaders in Pathological Psychology"; "Sex and Education"; "Gestalt Psychology"; "Obstacles the Sustenance of Developing Character." As can be seen from even this meager sampling, much ground is covered.

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U. S. Naval Air Station,
Pensacola, Florida.*

GERMANE, C. E., & GERMANE, E. G. Personnel work in high school: a program for the guidance of youth—educational, social, and vocational. New York: Silver Burdett, 1941. Pp. xv+599+index.

This book, subtitled *A program for the guidance of youth—educational, social, and vocational*, is based on experience in secondary school personnel

work gained in "five years of experimentation and investigation in forty-two high schools"—experimentation undertaken to "establish the basis for a personnel program in high school that could be initiated and conducted effectively, even under highly unfavorable conditions." This plan, in the opinion of the reviewer, is carried out remarkably well and in some detail.

The book sets forth a well-organized treatment of all of the topics usually found in works on high school guidance. Part I deals in regular fashion with the need for, and scope of, an organized personnel program. Part II devotes eight chapters to the problems of diagnosis of aptitudes, interests, and needs of students. Part III, under the heading of "Effective Ways of Providing Student Guidance," handles the role of the regular curriculum in a personnel program, the topic of individual counseling, and the problems of group guidance.

A most valuable feature of the book for high school teachers and counselors is the treatment of measurement and diagnosis given in Part II. Here are described a number of teacher-made or "improvised" tests and questionnaires which should be heartily welcomed by all secondary school systems with limited budgets. These materials, all of which are reproduced in full in the appendix, include various "Diagnostic Reading-Study Tests," a study-habits inventory, adjustment questionnaires, and a vocational interest inventory. They represent the "results of the co-operative work of administrators, teachers, and students" in compiling, testing, revising, and validating. Each of these instruments, and other diagnostic techniques, is set forth with full directions, suggested uses, advantages, and limitations. The reader is repeatedly cautioned against overinterpretation of data obtained by the use of these measuring instruments, against "playing hunches," indulging prejudices, etc.

One aspect of the book definitely disturbing to the present reviewer is the vocabulary. This is a minor point, to be sure, but it is somewhat unsettling to find the selected references at the end of each chapter entitled "Materials for Enrichment," or the repeated references to the ten "areas" of experience, *e.g.* Leisure and Hobby Area, World Relationships Area, Aesthetics, Culture, and Charm Area, etc. Also, one is apt to wonder about the fifteen "strategies" in personnel work, *e.g.* the Quintile Classification as a Strategy, the Parent-Teacher Coöperative Sheet as a Strategy, the Appraisal Chart as a Strategy, etc. In the same class of disturbing elements, to the reviewer, is the inclusion throughout the book of full-page illustrations of various high school activities having no connection whatsoever with the text. These appear to have been added in the publishing on the assumption that all books must be illustrated.

These are minor criticisms of an otherwise very worth-while work, but they may give an unfavorable first impression, which is definitely unwarranted. The book improves with reading. In the judgment of this reviewer, its wealth of useful diagnostic materials, its detailed treatment of techniques, and its insistence on reliable and valid information for guidance make this work one of the best handbooks available for the teacher or counselor in secondary schools.

E. DONALD SISSON.

Louisiana State University.

BOOKS AND MATERIALS RECEIVED

HILDRETH, G. The child mind in evolution: a study of developmental sequences in drawing. New York: King's Crown Press, 1941. Pp. 163+illustrations.

KORZYBSKI, A. Science and sanity: an introduction to non-Aristotelian systems and general semantics. (2nd ed., with supplementary introduction and bibliography.) Lancaster: International non-Aristotelian Library Publishing Company (Science Press, Distr.), 1941. Pp. lxxi+806.

MARQUIT, S. Understanding and dispelling fears. New York: Doma, 1941. Pp. 32.

RUNES, D. D. (Ed.) The dictionary of philosophy. New York: Philosophical Library, 1942. Pp. 343.

NOTES AND NEWS

At the 1941 Annual Meeting of the AMERICAN PSYCHOLOGICAL ASSOCIATION it was voted by constitutional amendment to broaden the criteria for TRANSFER FROM ASSOCIATE TO MEMBER or for DIRECT ELECTION AS A MEMBER. The action is described on page 831 of the November, 1941, issue of the *Psychological Bulletin*. New application and endorsement blanks implementing the action of the Association are now available upon request from the Secretary, Willard C. Olson, University of Michigan, Ann Arbor, Michigan.

A luncheon meeting and panel program was held on November 28 at the Roosevelt Hotel, New York City, to mark the TWENTIETH ANNIVERSARY OF THE PSYCHOLOGICAL CORPORATION and to honor its founder, JAMES McKEEN CATTELL. Those presiding at the panel discussions included: Drs. George H. Gallup, Walter V. Bingham, and Walter R. Miles. At the luncheon, Dr. E. L. Thorndike spoke, and a presentation, in honor of Dr. Cattell, for the advancement of the useful applications of psychology, was made on behalf of the Corporation by Dr. Paul S. Achilles.

THE CONNECTICUT VALLEY ASSOCIATION OF PSYCHOLOGISTS held its annual meeting on December 13 at St. Joseph College. The following officers were elected for the year 1942: President—Dr. Albert Kurtz, Life Insurance Sales Research Bureau; Vice-President—Dr. Margaret Kennedy, St. Joseph College; Secretary-Treasurer—Dr. Elmer Hagman, Hartley-Salmon Clinic; Program Chairman—Mr. Leonard Ferguson, University of Connecticut. Dr. Richard Sollenberger, of Mount Holyoke College, spoke on "Psychological Principles of Morale."

DR. LEO A. HELLMER, formerly of the University of Kansas, joined the staff of the Wichita Child Guidance Center on December 1.

DR. F. C. BARTLETT, professor of experimental psychology in the University of Cambridge, has been appointed a member of the British Medical Research Council to succeed the late Professor A. J. Clark.—*Science*.

DR. ZING-YANG KUO, director of the Institute of Physiology and Psychology at Chungking, is visiting England at the request of the Minister of Education for China and by invitation of the Universities' China Committee in London.—*Science*.

DR. NATHAN W. SHOCK, formerly research associate, Institute of Child Welfare, and assistant professor of physiology, Medical School, University of California, has been appointed senior psychophysiolgist in the National Institute of Health, U. S. Public Health Service. Dr. Shock will be in charge of the experimental program of the Unit on Gerontology of the National Institute of Health, which has established a laboratory in the Baltimore City Hospitals, Baltimore, Maryland.

THE departments of psychology and chemistry of the UNIVERSITY OF PITTSBURGH have received from the RESEARCH CORPORATION OF NEW YORK a grant of \$2000 for support of continued research on the nutri-

tional basis of abnormal behavior in experimental animals. The research was begun last year through the aid of both the Research Corporation and the Buhl Foundation of Pittsburgh. At present, the investigations are being conducted in the laboratories of experimental psychology by Mr. R. A. Patton and Miss R. C. Wylie under the direction of Dr. H. W. Karn and Dr. C. G. King.

AFTER several years of planning, the MENNINGER FOUNDATION was organized and incorporated under the laws of Kansas in April, 1941, with headquarters in Topeka. The purposes of this new, nonprofit psychiatric foundation are: (1) provision for psychiatric education, especially the training of young physicians in psychiatry. The shortage of well-trained psychiatrists will presently become acute in relation to the requirements of World War II and the postwar period; (2) encouragement of research in psychiatric and psychological fields; (3) making available psychiatric treatment for patients in the low income bracket; (4) prevention of mental illness, especially through development of child psychiatry and application of psychiatric knowledge to education and child-rearing.

In addition to local officers, the following trustees have been elected: Dr. Winfred Overholser, St. Elizabeth's Hospital, Washington, D. C.; Mrs. Albert Lasker, New York and Chicago; Dr. John C. Whitehorn, Johns Hopkins University, Baltimore; Mrs. Lucy Stearns McLaughlin, Santa Fe, New Mexico; Dean J. Roscoe Miller, Northwestern University Medical School, Chicago; Mrs. Sidney C. Borg, Jewish Board of Guardians, New York City; George E. Hite, Jr., Milbank, Tweed, and Hope, New York City.

The Menninger Foundation has already initiated several projects from the financial gifts which enabled it to make a modest beginning. Grants have been made for a 10-year study of the place of occupational therapy in psychiatric treatment, for a seminar and special Bulletin on Military Psychiatry and the distribution of this information to physicians on the Medical Advisory Boards of the entire country, and for research in the use of hypnosis in emergency psychotherapy and in substantiating newer psychiatric theories. Other projects are to follow.



Psychological Bulletin

JOHN ALEXANDER McGEOCH

It is with profound sorrow that the *Psychological Bulletin* informs its readers of the death of Professor John Alexander McGeoch on March 3, 1942, after a brief illness.

Dr. McGeoch was completing his first term as Editor of the *Psychological Bulletin* and had been recently re-elected for a six-year term. He was born at Argyle, New York, on October 9, 1897. He received the bachelor's degree from Westminster College in 1918, the master's degree from Colorado College in 1919, and the doctor's degree from the University of Chicago in 1926. Dr. McGeoch served on the Council of the American Psychological Association from 1936 to 1939; and he was a coöperating editor on the *Psychological Bulletin* from 1931 until he became Editor. At the time of his death he was professor of psychology and head of the psychology department at the State University of Iowa. In his passing, experimental psychology loses a brilliant investigator of the learning process, and his wide circle of friends lose a genial comrade.

CENTRAL NERVOUS MECHANISMS INVOLVED IN THE REPRODUCTIVE BEHAVIOR OF VERTEBRATES¹

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INTRODUCTION

Among the many avenues of approach to an understanding of human behavior several diverse lines of attack have proven fruitful. Two profitable methods of investigation have been the attempt to correlate man's behavior with the activity of his central nervous system, and efforts to gain insight into human reactions by explaining analogous responses in more easily studied lower animals. A combination of these two methods, involving an evolutionary approach to the problem of behavior and the nervous system, has achieved definite contributions and offers promise of rapid advancement toward a scientific interpretation of behavior.

As the physical structure of the Hominidae has evolved from that of more primitive vertebrates, certain phases of man's behavior have developed as an elaboration of simpler reaction patterns displayed by ancestral forms. Correlation between changes in structure and in function is especially striking in the case of the central nervous system. Progressive increase in the mass and degree of differentiation of the vertebrate forebrain has been paralleled by simultaneous modification of relationships between organism and environment. Increase in the modifiability of reaction patterns and decrease in the proportion of the behavior repertoire controlled by innate organization have occurred in conjunction with evolutionary changes in the telencephalon.

Although the progenitors of modern vertebrates are not available for experimental study, the relationships between behavior and evolutionary changes in the brain are subject to investigation. The evolution of certain types of behavior may be revealed by a study of one response pattern elicited in a number of different species selected from different levels on the phylogenetic scale. By investigating a form of behavior that persists throughout all classes and by determining the function of the brain in the mediation of

¹ Presented in modified form as the tenth annual James Arthur Lecture on the "Evolution of the Human Brain."

such behavior, it is possible to gain at least a partial understanding of the relationships between evolutionary changes in the brain and concomitant alterations in behavior.

The present review constitutes an attempt to assemble evidence dealing with the function of the central nervous system in the reproductive behavior of vertebrates. Studies dealing with each class of vertebrates are presented together, although for many classes little or no evidence is available. Reproductive behavior includes activities involved in courtship, mating, and care of the young.

FISH

Among the cichlid fishes visual cues are of primary importance in reproductive activity. The blind male Jewel Fish (*Hemichromis bimaculatus*) can fertilize the eggs, but his behavior is totally lacking in coordination (72). According to Breder (22), mating behavior in all male cichlids involves visual recognition of the gravid female on the basis of characteristic movements of her dorsal and anal fins. Male Swordtails (*Xiphophorus helleri*) appear to recognize other males visually by the presence of the sword and gonopodium; and male Guppies (*Lebistes reticulatus*) discriminate visually the sex of other members of their own species (67). Male Rainbow Darters (*Etheostoma coeruleum*) differentiate between other males and females on the basis of visual cues (76). Gravid female Jewel Fish discriminate between males and females in adjacent aquaria (72).

Many fishes exhibit elaborate courtship and spawning behavior involving exact integration and synchronization of the responses of the sexual partners (72). In some species of cichlid fishes the forebrain is essential to the spatial and temporal organization of reproductive behavior.

Mating behavior in the Jewel Fish includes cleaning of a nest site, laying and fertilizing the eggs, guarding and fanning the eggs, removal of the newly hatched young to a previously prepared depression in the sand, and attracting the young by specific fin movements. In these activities both parents cooperate.

Unilateral destruction of the forebrain (corpus striatum) in this species does not prevent normal reproduction, but bilateral forebrain ablation abolishes courtship and mating (70). Small bilateral lesions to the forebrain do not interfere with normal courtship and spawning; but a female Jewel Fish suffering such brain injury may

not permit the male to assist her in care of the eggs and young. The normal mate of the operated female is often attacked if he approaches eggs or newly hatched brood (68). Normal brooding females ordinarily permit the male mate to assist in the care of the brood, but attack any other adult that approaches the eggs or young.

Extensive injury to both hemispheres of the forebrain disorganizes the mating and brooding responses of the Jewel Fish and may eliminate one or more of the behavioral elements in the serial pattern (68). There is no indication of localization of function within the corpus striatum. The number of elements eliminated is a function of the amount of forebrain removed, and the same defect can be produced by restricted destruction in different parts of the corpus striatum. Postoperative disruption of reproductive behavior is permanent, appearing in 12 to 28 spawnings over a period of 12 to 19 months.

Hormones may activate patterns of response in the Jewel Fish, but the forebrain is essential to the integration of discrete reactions into a biologically effective whole (68). Sensitization of the neural mechanisms involved occurs as a result of the first spawning. After but not before the initial spawning, brooding behavior can be induced in the female Jewel Fish by the administration of corpus luteum, progesterone, prolactin, anterior pituitary extract, fresh fish pituitary, thyroxin, or phenol (73).

The African Mouthbreeder fish (*Tilapia macrocephala*) exhibits a complex pattern of courtship and mating followed by two weeks of buccal brooding of the eggs by the male. Injury to the corpus striatum results in asynchronization of the parents' reproductive behavior (66). Control lesions in the cerebellum reduce plasticity of movement without affecting egg laying, fertilization, or buccal brooding.

In the courtship pattern of the Mexican Swordtail fish (*Xiphophorus helleri*) the male assumes all initiative. The female plays a completely passive role, and all of the male's behavior is oriented toward her. The courtship and spawning behavior of this viviparous species survives total forebrain ablation (70).

AMPHIBIA

Evidence as to the neural basis of mating in the frog is contradictory. Tarchanoff (6) held that the sexual clasp of the male frog depends upon sensations arising from the distended sperm blad-

der. This view was thrown in question by reports of normal clasping in males castrated in breeding season (42, 83). Clasping is eliminated, however, if castration occurs before the onset of the mating season. These data suggest the existence of an endocrine factor sensitizing the neural mechanisms responsible for amplexus.

Schrader (85) described a midbrain center which he regarded as essential to the maintenance of amplexus. Males deprived of the midbrain clasped females placed in their grasp but released quickly. Persistence of the males' clasp was regarded by Schrader as dependent upon tactile sensations mediated by the midbrain. Dissection of the midbrain caudal to the plexus of the cerebellum raised the excitability of the "clasp center," and males sustaining such injury clasped any object encountered.

Edinger (42) reported heightened clasp reflexes following transection of the medulla posterior to the cerebellum, and maintenance of amplexus despite decapitation. Tarchanoff (6) located the mechanisms essential to amplexus in the optic lobes. He found that electrical stimulation of this area induced clasping, and destruction of the superior colliculi eliminated the response. Similar results with the male toad led Baglioni (5) to the conclusion that the optic lobes contain excitatory centers mediating the sexual clasp. Directly contradictory conclusions were advanced by Tarchanoff (6) and Albertoni (1), whose independent investigations led them to believe that centers in the superior colliculi exert an inhibitory effect, causing relaxation of amplexus.

In *Rana pipiens* the sensory basis for pursuit and clasping of the female is apparently visual and tactile. Peripherally blind males of this species do not show the normal response of crossing the tank to clasp another frog, but will display amplexus if tactile stimulation occurs (69). At the same time the eyeless *pipiens* is quite inactive, displaying total loss or marked reduction of feeding behavior. Vision is apparently the dominant sense modality. The South African Clawed Toad (*Xenopus laevis*) possesses relatively small eyes and is seemingly less dependent upon visual cues in mating. Peripherally blind *Xenopus* clasp the female vigorously, but execute a high percentage of abnormal clasps, seizing the female by the forelimbs or hindlimbs instead of in the lumbar region. In such cases the clasp is usually corrected rapidly, and mating proceeds normally (18).

Noble and Aronson (69) found that pursuit and clasping of a female are not affected by removal of the forebrain of the male

frog (*Rana pipiens*) if the preoptic area is spared. Destruction of the preoptic area without injury to the remainder of the forebrain does not interfere with this behavior. Ablation of the entire forebrain including the preoptic area ordinarily eliminates pursuit of the female. However, a male deprived of all forebrain will follow and clasp the female if she swims by and comes in contact with any part of his body.

Apparently the normal male's tendency to cross the tank and approach another frog depends jointly upon vision and functions of the forebrain. Orientation of this character can be mediated centrally by the intact forebrain, by the preoptic area (in the absence of other portions), or by the remainder of the forebrain (in the absence of the preoptic area). With the occurrence of tactile stimulation, however, mating is independent of visual cues and of forebrain function. This conclusion receives support from the observation that the forebrainless male will clasp the female if placed upon her back (6). In addition, such a male maintains amplexus and executes all elements of the normal masculine pattern until the female has oviposited (69).

The frog's reduced responsiveness to many types of stimuli following destruction of the forebrain is reflected in the observations of several authors. Blankenagel (20) reported elimination of the "power of attention" and of "spontaneous movement" in decerebrate frogs. According to Burnett (30), the decerebrate frog is "incapable of forming even the simplest associations."

The experiments of Noble and Aronson (69) indicate that in the case of *Rana pipiens* the male's release of the female after oviposition depends upon the function of the preoptic area of the forebrain. Whereas normal males release the female within a minute after the eggs have been extruded, frogs suffering destruction of the preoptic region maintain a sexual clasp with the spent female for several hours after oviposition. Lesions to other parts of the forebrain do not affect the release response.

REPTILES

Investigations of brain function in the reproductive behavior of reptiles are limited. Information on this topic would be of especial value to a phylogenetic interpretation of behavior because the cerebral cortex makes its first appearance in the reptilian brain.

The sensory basis of mating reactions in lizards is not clearly defined, but vision is undoubtedly very important. Diebschlag

(39) reported nearly total inactivity in blind males. Noble and Bradley (71) regarded vision as the most important sense involved in the courtship of lizards. If a female *Sceloporus undulatus* is painted to look like a male, she is treated as a male by other individuals (65).

Unilateral decerebration has no effect upon the courtship and mating behavior of male Emerald Lizards (*Lacerta viridis*), according to Diebschlag (39). Males suffering loss of both cerebral hemispheres exhibit no reproductive behavior. Drastic reduction in all spontaneous activity accompanies loss of courtship and mating in the decerebrate reptiles.

BIRDS

Peripherally blinded male pigeons court the female, but fail in their copulatory attempts because of poor orientation (84). The role of visual stimuli in the female pigeon's ovulatory cycle is revealed in the findings of Matthews (61), who reported failure of ovulation in isolated birds. Females allowed sight of another pigeon or given mirrors in their own cages continued to lay eggs. Opportunity for auditory and olfactory stimulation derived from other pigeons was not followed by ovulation if visual stimuli were excluded.

According to Schrader (85), unilateral decerebration has no effect upon reproductive behavior in pigeons. The completely decerebrate female pigeon makes no response to the courtship of the male, and, although she lays eggs, will not brood them. The fore-brainless male pigeon exhibits courtship and "shows plainly that it is in heat,—but its endeavours have no object." In a more recent study Rogers (79) found that decorticate pigeons are capable of mating, but loss of cortex and hyperstriatum eliminates reproductive behavior. Rogers suggested that the hyperstriatum "ties together" the discrete elements making up the mating pattern (cooing, fighting, regurgitation, preening, and copulation).

MAMMALS

Rabbit

Peripherally blind male rabbits mate with the estrous doe (25, 84). Anosmic males achieve coition without apparent difficulty (25, 89).

Bucks suffering abdominal sympathectomy mate with the female, but do not display orgasm or the final vocalization, and the

male's tendency to fall off of the female after ejaculation is absent from the copulatory pattern (3). Erection and ejaculation in the male rabbit occur in response to electrical stimulation of the sacral cord (40). Injury to various regions in the cerebral cortex (90, 91) or complete decortication (25) does not abolish mating in the male. Combined destruction of the cortex and the olfactory bulbs eliminates copulatory behavior (25). These findings suggested to Brooks the conclusion that several factors contribute to sexual arousal and mating. If a considerable portion of the neocortex is intact, the male rabbit is not dependent upon olfaction or vision. In the absence of neopallium the olfactory apparatus is essential to the initiation of mating behavior. Transection of the infundibulum does not prevent mating in the male (28).

Cauterization of the nasal mucosa is followed by reduction of sexual appetite and decrease in testicular volume in the male rabbit, according to Cahane and Cahane (31). After similar treatment the female's breeding behavior and gestation are normal.

In the female rabbit ovulation occurs apparently as a result of sexual excitement and depends upon the function of the hypophysis. Pituitary activity in turn constitutes a response to nervous stimulation *via* the infundibular pathway from the hypothalamus. That direct stimulation through the stalk is the important factor is indicated by several lines of evidence. Transection of the stalk prevents ovulation, but does not interfere with copulatory behavior (26). Severance of the sympathetic chains has no effect upon ovulation. Electrical stimulation of the hypothalamus dorsal and rostral to the optic chiasma produces ovulation (49, 50), and direct stimulation of the pituitary has the same effect (49). Injection of copper salts, picrotoxin, or metrazol results in ovulation in the normal estrous doe (27). This effect is probably caused by the activation of a central nervous mechanism which sends impulses to the pituitary. Ovulation does not occur after administration of drugs if the pituitary stalk is sectioned. Infundibular lesions are reported to result in genital atrophy in male and female rabbits (49).

Guinea Pig

There is little direct evidence to indicate the sensory basis of mating behavior of the male or female guinea pig. Overt copulatory behavior of the male guinea pig is normal after sympathetic denervation of the genitals, although ejaculation does not occur

due to paralysis of the smooth muscles of the vas deferens, seminal vesicles, and prostate (4). Section of the spinal cord in the male causes erection and ejaculation (2). The same phenomena may be produced by applying an electric current to the sacral cord and anus (13, 40, 63, 64). According to Magnotti (58), removal of the olfactory bulbs in the young male guinea pig is followed by arrest of genital development and inability to reproduce.

The female guinea pig's mating pattern includes one phase of "male-like mounting behavior" and a second type of response involving lordosis and opisthotonos in response to the male's sexual clasp. Both of these phases are dependent upon the synergistic action of estrogen and progesterone, but separate neural mechanisms may be involved (98).

Spayed female guinea pigs injected with estrogen and progesterone show normal receptive behavior in response to the male's mounting and clasp reactions despite combined unilateral or bilateral destruction of the neocortex, hippocampus, and the caudate-putamen complex (35). Lordosis, opisthotonos, and ovulation are normal in females deprived of 75% of the neocortex, but more extensive decortication in some cases eliminates ovulatory reactions. Destruction of the septal area or the pretectal region has no effect upon ovulation or mating. Mesencephalic invasion destroying the inferior colliculi abolishes receptive behavior and its converse (avoidance reactions during dioestrus), but does not eliminate ovulation. Sexually receptive behavior and ovulation survive section of the pituitary stalk (34).

Findings reported by Dempsey and Rioch (36) suggest that the neural mechanisms essential to lordosis and opisthotonos in the female guinea pig are located in the brain stem caudal to the anterior margin of the mammillary bodies and rostral to the intercollicular level. These workers observed survival of estrous responses in the female after transection of the brain stem just anterior to the mammillary bodies. A second section anterior to superior colliculus and posterior to the mammillary bodies eliminated sexually receptive responses. Spinal sections from L2 to T5 abolished mating behavior.

Results described by Brookhart, Dey, and Ranson (24) localize the central nervous mechanism essential to the integration of the female's mating behavior in the midventral portion of the anterior hypothalamus. These authors conclude that there is no essential mechanism in the region of the mammillary bodies or the mesen-

cephalic tegmentum. They suggest that the results of Dempsey and Rioch (36) were based upon inaccurately localized lesions. Using a modified Horsley-Clark apparatus, Brookhart, Dey, and Ranson placed lesions at the level of the posterior border of the optic chiasma. Spayed female guinea pigs injected with estrogen and progesterone were tested for estrous behavior before and after operation. Injury six millimeters above the ventral surface of the brain had no effect upon mating reactions. Females with lesions one millimeter above the ventral brain surface displayed no sexually receptive responses despite a fourfold increase in the amount of hormone injected.

Brain injury confined to the area between the optic chiasma and the attachment of the infundibular stalk produces any one of four conditions in the female guinea pig. Dey, Fisher, Berry, and Ranson (38) described the results of such destruction as follows: (1) vagina always open, large uteri, follicular ovaries without corpora lutea, estrous behavior in only one case; (2) vagina always open, atrophic uteri, no follicles or corpora lutea, no estrous behavior; (3) normal vaginal and ovarian cycles, estrous behavior in only one case; (4) irregular vaginal cycles, ovaries either completely follicular or completely corpora lutea, estrous behavior greatly reduced or absent.

Rat

Stone (87, 88) reported mating in the male rat subsequent to combined surgical elimination of the receptors mediating the following sensory modalities: vision, olfaction, audition (partial), touch (in the vibrissae), and cutaneous sensitivity of the ventral body wall and scrotum. A more recent investigation (17) indicates that sexually experienced males will continue to copulate after being deprived of any two of three types of sensory receptors: visual, olfactory, and cutaneous (in the snout and lips). Combined elimination of all three modalities eliminates masculine copulatory behavior. Sexually inexperienced males raised in isolation are capable of copulating after loss of vision, olfaction, or cutaneous sensitivity in the snout and lips. After such loss, sexual excitability is reduced. The inexperienced male does not copulate after combined elimination of any two of the above-listed sensory avenues. As a result of these findings Beach (17) concluded that the arousal of sexual excitement in the male rat is not dependent upon stimuli of any one type, but normally occurs as a result of multisensory

stimulation involving the occurrence of central summation and facilitation.

Abdominal sympathectomy is reported by Bacq (2) to render the male rat impotent, although the testes are not affected. A low-voltage current applied to the rectum and at the third sacral region of the cord produces erection and ejaculation in the male (40). Stone (93) observed normal mating behavior in male rats prepubertally deprived of 50% of the cerebral cortex. Davis (33) found that after nearly complete decortication some male rats were able to impregnate receptive females. Other males with similar lesions copulated only after injection of testosterone propionate. A third group of cortical operates failed to mate despite administration of male hormone.

Beach (16) concluded that injury to the neocortex in the male rat reduces the ease with which sexual arousal occurs but does not interfere with the motor pattern of copulation. The probability of postoperative coition was found to be inversely related to the amount of neopallium destroyed. When lesions did not exceed 40% of the total cortex, postoperative mating was often spontaneous and, in other cases, could sometimes be elicited after administration of testosterone propionate. Males deprived of more than 60% of the cortex did not mate even though massive doses of male hormone were administered. When postoperative mating did occur, the pattern and vigor of the response were normal.

Mating is not abolished in male rats by injury to the supraoptic nuclei, to the median eminence, or by interruption of the hypothalamico-hypophysial connections in the tuberal region (29).

Mating in the female rat does not depend upon sensations from the uterus and vagina. Females surgically deprived of these organs display normal receptive behavior (7). "Intersexed" female mice treated prenatally with androgens develop no external vagina. Nevertheless, such females display normal ovarian cycles and feminine copulatory behavior (75). Diencephalic lesions are reported to cause genital atrophy in the female (31). Unilateral hypothalamic injury or destruction confined to the median preoptic area or to the posterior hypothalamus does not disturb the estrous cycles and mating performance of the female. However, "lesions confined to the anterior hypothalamus produce among other abnormalities a change in the estrous cycles and a deficiency of certain reproductive functions of the female rat" (29). Infundibular section does not interfere with normal reproductive

cycles, ovulation, mating, or pregnancy in the female rat (37).

Removal of as much as 80% of the cerebral cortex does not eliminate copulation and gestation in the female (93). Complete decortication abolishes mating in some females, but leaves others capable of coition and gestation (33).

Maternal behavior in the female rat survives abdominal sympathectomy, but there is failure of, or reduction in, lactation (3). Destruction of varying amounts of cerebral cortex interferes with maternal behavior of the primiparous female (14). Quantitative tests on partially decorticated females revealed deficits in one or all of the following phases of maternal behavior: (1) nest-building prepartum, (2) cleaning and collecting of young at parturition, (3) retrieving scattered young to the nest, (4) moving nest and young from under an electric heater, (5) moving nest and young from an air blast. The extent to which an operated female's score fell below averages for the normal control group was roughly proportional to the amount of cortex removed. Restricted injury appeared to interfere with the female's ability to integrate her behavior without abolishing any of the specific reactions tested. There was no clear-cut evidence for localization of any of the abilities observed. Extensive lesions involving two-thirds of the neopallium eliminated maternal reactions.

Stone (92), employing similar tests, obtained qualitatively comparable results. Davis (33) found no disturbance in maternal behavior after unilateral hemidecortication, but reported elimination of such reactions after bilateral ablation of the cortex. Davis's failure to detect reduction in maternal efficiency after hemidecortication rests upon absence of quantitative tests. His data show merely that the female with a 50% lesion may be capable of bearing and rearing her litter if she is not called upon to adapt to experimentally altered environmental forces.

Cat

Characteristic sex behavior has not been observed in decorticate male cats (11, 77), but no complete studies have been reported. That some elements in the masculine mating pattern can be mediated at a spinal level is indicated by the observations of Dusser de Barenne and Koskoff (41), who reported that a spinal male placed in a prone position with the hind quarters contacting the table showed priapism. Experiments by Root and Bard (80) add to our understanding of spinal mechanisms involved in the male

cat's copulatory performance. Males deprived of the sacral cord and the lower two lumbar segments show erection after they have seized the estrous female. Since in such operates the genitals are anaesthetized, it becomes apparent that afferent impulses from the genitalia are not necessary to penile erection. Complete extirpation of the abdominal chains, or inferior mesenteric ganglionectomy (preceded by lumbosacral removal), eliminates erection but does not impair sexual aggressiveness. Decorticate male cats do not show reflex penile vasodilation in response to manipulation of the genitals (11).

Sexual receptivity and normal mating behavior in the female cat is possible after abdominal sympathectomy and removal of the tubes, uterus, and proximal two-thirds of the vagina. An estrous female suffering removal of the sacral cord permits the male to mount, but fails to show the normal treading in response to mechanical stimulation of the vagina. After midthoracic section the female's "foreparts . . . engaged in typical courtship activities." The foregoing observations led Bard (8) to conclude that afferent impulses from the vagina are not essential to the female's mating pattern. Removal of the eyes, olfactory bulbs, or cochlea has no effect upon the spayed female's ability to display mating behavior after injections of estrin (10).

The female's mating pattern includes rubbing the head and ears against the floor. This reaction may result in vaginal stimulation, for Bradford (21) has shown that manual stimulation of the external ear produces contractions of the smooth musculature of the vagina in estrous cats.

Complete decortication coupled with injury to the hippocampus, rhinencephalon, and striatum does not abolish receptivity and mating in spayed female cats injected with estrogen (9). The threshold of response to estrin may be raised by such brain injury, however. One female deprived of all neocortex, parts of the rhinencephalon and striatum, and the rostral half of the thalamus showed spontaneous estrus and gave the normal response to vulvar stimulation (crouching, treading, and growling). When in heat this animal attracted males, but resisted their attempts to copulate unless chance stimulation of the vagina occurred, in which case intromission was permitted and normal mating followed (12). Apparently, vaginal sensation may contribute to sexual receptivity, although studies cited above indicate that normal mating can occur in the absence of such sensory data.

Ranson (74) reported that female cats with "large bilaterally symmetrical lesions in the tuber, lateral to or behind the infundibulum" mate, give birth to normal litters, and suckle their young. Female cats with small lesions in the hypothalamus interrupting the supraoptico-hypophyseal tract do not come into estrus and show no mating behavior according to Fisher, Magoun, and Ranson (43). The same workers found that female cats suffering hypothalamic lesions producing diabetes insipidus displayed partial or total failure of ability to deliver young. Labor was prolonged and usually fatal.

Magoun and Bard (59) observed marked individual difference in the mating responses of female cats subjected to extensive invasion of the hypothalamus and mesencephalon. Removal of the caudal portions of the hypothalamus did not prevent estrual reactions in spayed females injected with estrogen. Destruction of most of the anterior hypothalamus eliminated estrual behavior in one case, but a second female with practically the same type of lesion exhibited well-defined sexual behavior under the influence of estrin. Some evidence indicates a mesencephalic locus for the mechanisms essential to estrous behavior, but Bard (11) has described marked reduction in such behavior following the infliction of large lesions confined chiefly to the hypothalamus and invading very little of the midbrain.

Rioch (77) concluded that the hormones essential to sexual receptivity in the female cat act upon the central nervous system at some point between the nucleus ruber and striatum and the basal olfactory areas, although neither of these "boundary regions" is essential to mating behavior. Dempsey and Rioch (36) localized the mechanisms controlling mating in the brain stem caudal to the anterior margin of the mammillary bodies and rostral to the intercollicular level. Observations reported by Bard (10) show that after decerebration at the pontile or low mesencephalic level both estrous and nonestrous female cats respond to vaginal stimulation with collapse of the extensor rigidity of the forelegs. This response, not shown by males and evoked in the female only by vulvar stimulation, results in a posture similar to the copulatory crouch of the intact estrous female. Bard suggests the possibility that the crouch of the decerebrate female reveals a primitive bulbospinal mechanism mediating a major postural adjustment of estrus. Since the response occurs at any stage in the estrous cycle, the mechanisms involved do not depend upon hormonal sensitization. The fore-

going analysis, if correct, indicates, according to Bard, that estrin activates higher centers which elaborate and integrate the phasic items in the female's reproductive pattern.

The findings of Maes (55, 57) indicate conclusions opposed to those of Rioch, Dempsey and Rioch, and Bard, cited above. Maes observed sexual treading, opisthotonos, and lateral deviation of the tail in female cats subjected to transection of the spinal cord at the first cervical level. These reactions, elicited in response to mechanical stimulation of the perineum, were displayed by females showing normal estrus and by spayed animals injected with estrogen. Nonestrous cats or noninjected castrates did not show the behavior. These data indicate that treading, opisthotonos, and lateral deviation of the tail are short arc reflexes dependent upon spinal mechanisms which function only under specific hormonal stimulation. Maes suggests that in the female cat's mating pattern higher centers may coördinate independent acts pre-existing at different levels of the brain stem. The absence of estrous reflexes in decerebrate cats studied by Dempsey and Rioch (36) was probably due to decerebrate rigidity which eliminated the essential normal muscle tone, according to Maes.

Bromiley and Bard (11) have confirmed certain aspects of the work performed by Maes. They report, however, that tail deviation is shown by males as well as by females and that the other reactions described by Maes can be elicited in anestrous females. Bromiley and Bard conclude that these behavioral elements are not strictly "estruai" because they appear independently of estrogenic effects. It is possible, however, that estrogen produces a quantitative increase in such reactions (11).

Although the exact locus of action of estrogen is debatable, its influence apparently need not be exerted *via* the pituitary. Maes (56) found normal heat behavior in hypophysectomized female cats injected with estrogen.

Dog

Von Bechterew (96) produced erection in the dog by electrical stimulation of the cortex. Erection and ejaculation are elicited by the application of an electric current to the lower cord and anus (48). Erection and ejaculation can be evoked by genital stimulation after complete section of the cord at the supralumbar level (11). Following lumbar section, manipulation of the genitals elicits a series of reactions in the male dog which is highly suggestive of

copulatory behavior. They include bilateral extension at the knees, ankles, and hip joints, depression of the tail, and downward curving of the pelvic portion of the body (82). These responses, which cannot be evoked in the bitch, suggest a spinal integration of independent reactions involved in the normal mating behavior of the intact male.

That higher nervous centers contribute to sexual behavior is indicated by the report of Goltz (47) that a partially decerebrate male dog showed no interest in the rutting female, and by the fact that mating behavior has not been observed in decerebrate males (11). It is difficult to elicit reflex penile vasodilation in decerebrate dogs by mechanical stimulation of the genitalia (11).

Decerebrate female dogs in estrus do not show collapse of extensor rigidity of the forelegs in response to vaginal stimulation (11). The significance of this observation lies in the fact that such responses are elicitable in the spinal cat, and the resulting posture closely resembles the sexual crouch characteristic of the feline copulatory pattern. The feminine canine copulatory response does not include the sexual crouch.

Normal estrus, mating, gestation, and maternal care in a bitch suffering complete lumbar section have been reported by Goltz (46).

Subhuman Primates

Klüver and Bucy (52, 53) reported "hypersexuality" produced in the macaque by bilateral removal of the temporal lobes. Male monkeys suffering such brain injury exhibited pronounced priapism, greatly increased manual and oral masturbation, excessive homo- and heterosexual intercourse. Females repeatedly displayed sexual presentation responses, and one case showed this reaction despite ovariectomy and hysterectomy. Unilateral temporal lobectomy, or bilateral removal of other brain areas, did not produce these alterations in sexual behavior.

No operative studies of reproductive behavior in anthropoids have been reported, but evidence indicates that the organization of copulatory activities in the chimpanzee depends upon individual experience. One of the most exhaustive studies of mating behavior in the chimpanzee was performed by Bingham (19). An inexperienced male was totally unable to achieve coition with a receptive female. Erection occurred readily, but intromission was not even attempted until the more experienced female lent active assistance. Prepubertal sex play occurs frequently among immature chim-

panzees of both sexes, and the organization of the reproductive act is gradually perfected as a result of practice.

Maternal behavior does not appear in well-developed form without opportunity for practice. Yerkes (97) has observed that primiparous chimpanzees may not accept or care for their first-born young. Instead, some inexperienced mothers "behave as if surprised, bewildered and lacking in suitable ready-to-hand patterns of behavior." They fail to eat the afterbirth. Multiparous females eat at least a part of the afterbirth and treat the infant as a familiar object.

Man

Reflex erection in the male human is not dependent upon the functional integrity of the neopallium, for it occurs in infants before myelinization and growth of the cortex are complete. The existence of spinal centers controlling erection and ejaculation is indicated by the appearance of these reflexes in man in response to genital stimulation after supralumbar transection of the cord (11).

At the same time there is evidence for the importance of higher nervous mechanisms in copulatory behavior. Stier (86) reported complete or noticeable loss of libido and potency in 30 of 33 men suffering head trauma in which the diencephalon was the focus of damage. Many cases were totally impotent. Others were capable of intercourse at rare intervals, but found the act excessively long and exhausting. Symonds (94) found that brain injury involving structures comprising the floor of the third ventricle may be followed by loss of sexual desire and potency.

The importance of social conditioning in human sex life is undoubtedly great, but admittedly difficult to evaluate. There is some evidence to indicate that the overt expression of libido is dependent upon social training. It may be significant to note that cases of feral man seem to reflect low sex drive rather than high sexual excitability. Several reports reveal almost total lack of interest in sexual matters on the part of the adult males Tomko of Zips and Kaspar Hauser. The wolf-children of Nidnapore, the wild-boy of Aveyron, Kamala, and the wild-boy of Kronstadt appear to have exhibited certain restlessness and "unpatterned behavior" at the onset of puberty, but there are no reports of sex offenses. These fragmentary data lead one to agree with Zingg's suggestion that in human beings "the social channeling of sex is much more necessary for its full expression than might be thought" (99).

Although in man as in the other vertebrates sexual impulses

are intimately associated with secretions of the sex glands, human libido may persist in the absence of such endocrine factors. One case of normal and regular intercourse nine years after postpubertal castration of a male patient is described by Rowe and Lawrence (81). In another instance normal masculine copulatory behavior is reported to have survived 20 years after gonadectomy (95). Feinier and Rothman, as reported in Moehlig (62), recorded a case involving complete retention of libido and copulatory ability for 30 years following testis removal. The importance of psychic factors in the postcastrate survival of mating behavior has been stressed (62). Studies of approximately 300 war-wounded patients convinced Lange (54) that libido and potency may be maintained indefinitely after castration. Many patients suffer reduction in, or loss of, potency but retain full libido. A few cases of heightened libido are reported. In many individuals all sex drive and ability are lost.

In the human female loss of libido and amenorrhoea may follow brain injury involving the floor of the third ventricle (94). The importance of genital stimulation to the occurrence of high sexual excitement is well known. Friedgood (45) reports restoration of sexual desire, occurrence of "libidinous feeling," and cessation of amenorrhoea after faradization of the cervix in a patient whose ovarian cycles and libido had been absent for seven years. Although endocrine therapy had proven unsuccessful in this case, faradic stimulation of the cervix (seven treatments) was followed by three years of fairly normal menstrual cycles and sex desire.

Ovariectomy in the human usually produces a gradual loss of desire for intercourse and elimination of the pleasurable sensations associated with coitus; but in some cases these functions are retained (60). Sensations of orgasm may survive castration in women (32, 44).

DISCUSSION AND CONCLUSIONS

Although experimental evidence is incomplete, the data summarized in the present review suggest several relationships between patterns of reproductive behavior and the central nervous system in vertebrates.

Changes in the Form of Reproductive Behavior

The courtship and mating of the lower vertebrates first appear in the individual soon after the occurrence of physiological ma-

turity; and throughout the reproductive span the behavior patterns are executed in fairly stereotyped fashion. It is apparent that innately organized mating and parental responses are not subject to extensive modification as a result of individual experience. Fish that display elaborate courtship and definite parental behavior do so without opportunity for learning, and the patterns show little or no evidence of individual modification. If environmental conditions are altered during courtship, spawning is disrupted. If the fish with young is disturbed, the fry are either eaten by the parent or left to die of neglect.

The courtship behavior and parental care of many species of birds are only slightly more modifiable than those of the fish, amphibian, and reptile. Mating is relatively stereotyped, and experimental alteration of the appearance of one of the pair frequently prevents courtship. Care of the young proceeds only so long as pronounced environmental interference does not occur. If the nest is disturbed or the sensory qualities of the young modified, the parent is apt to desert the brood and start a new nest and clutch elsewhere.

In some lower mammals, such as the rat, responses involved in mating and care of the young are innately organized. The behavior patterns appear without opportunity for learning and customarily proceed in a more or less stereotyped fashion. If, however, it becomes necessary for the individual to diverge from the inherited pattern, such adjustment is possible. The primiparous rat is capable of choosing a dark nest site for parturition, building a good nest, cleaning and collecting the young, etc. If the nest site is made untenable by experimental alteration of environmental conditions, the female does not desert her litter, but moves the young and rebuilds the nest in a more suitable location. The ability to modify inherited behavior on the basis of individual experience is dependent upon the function of the cerebral cortex, which is nonexistent or rudimentary in the brains of lower vertebrates but highly developed in mammals. Extensive injury to the neocortex may leave the female rat able to carry out her maternal duties in a stereotyped fashion, but renders her incapable of modifying parental responses to adjust to environmental changes. It is of interest to note that female rats which score above average on tests of maternal behavior also rank above average in maze-learning ability (15).

The reproductive behavior of the highest vertebrates is ap-

parently not completely organized on an inherited level. In primates mating responses and care of the young are not only subject to, but at least partially dependent upon, learning.

During the evolution of vertebrates reproductive behavior has undergone a gradual change. Stereotyped inherited forms of reproductive behavior have been replaced by innately organized patterns subject to ontogenetic modification; and these in turn have broken down so that the organization of the complete mating or parental pattern is not inherited but must be filled out through individual experience. These changes have taken place concomitantly with the gradual increase in size and specialization of the forebrain. The modifiability of reproductive behavior in the lower mammals is apparently associated with the acquisition of the cortex. Increasing dependence upon individual experience, as contrasted with reliance upon innately organized response patterns, goes hand in hand with progressive growth and differentiation of neopallium.

Sensory Basis of Mating

The reproductive behavior of lower vertebrates appears to depend heavily upon sensory stimuli mediated by a single type of receptor. Blind fish of several species are practically incapable of courtship and mating. The blind male frog does not mate unless chance contact with the gravid female occurs. This tendency for one type of sensory data to dominate the reaction possibilities of lower vertebrates is not restricted to reproductive activity, but is revealed in all types of behavior. Because of their nearly complete dependence upon a single sensory modality the blind frog, the anosmic shark, and the blind lizard starve to death in the midst of an adequate food supply.

Although birds are somewhat less dependent upon any one type of sensory stimulation than are most species of fish, amphibia, and reptiles, the birds tend to rely chiefly upon vision for orientation of their reproductive activity. The blind male pigeon may court the female, but is unable to copulate effectively. The female pigeon's ovulatory cycle is initiated exclusively by visual cues.

In sharp contrast to the mating activity of the lower vertebrates the reproductive behavior of mammals is independent of any one type of sensory stimulation. Male rodents, carnivores, and primates are capable of mating normally in the absence of vision, audition, olfaction, or cutaneous sensitivity in the sex zones.

Whereas no single type of stimulus is essential to the activation of the mating responses, there is evidence that several kinds of sensory data contribute to the arousal of sexual excitement and the consequent occurrence of mating. Mating in the female mammal appears to be equally independent of restricted sensory cues, for removal of nearly all exteroceptors does not eliminate the female's copulatory response.

These differences in the sensory basis of mating in various classes of vertebrates are directly correlated with variations in the structure of the brain in each species. Each area in the forebrain of the lower vertebrates is "dominated by a single functional system" (51). Every group of cells is directly connected to an effector or receptor system. The forebrain of the frog is devoid of "association areas," regions free from the dominance of single sensory systems. The mammalian forebrain includes numerous association areas connected indirectly with several peripheral receptors and providing a physical basis for the interaction of multisensory stimuli.

In general it appears that, as the size and degree of differentiation of the forebrain have increased, vertebrates have become less dependent upon single types of sensory data. Many reactions including mating have come to be evoked by combinations of stimuli rather than by discrete unisensory cues. This change in behavior has occurred simultaneously with the appearance of forebrain association areas receiving impulses from several independent sensory systems and providing the anatomical substratum for multisensory interaction, summation, and facilitation.

Central Nervous Control of Reproductive Behavior

Most of the evidence suggests that in all classes of vertebrates the discrete acts involved in patterns of courtship, mating, and parental care are mediated by nervous mechanisms located in the brain stem and spinal cord. Decerebrate fish, amphibia, reptiles, birds, and mammals are apparently capable of all motor adjustments necessary to the execution of such behavior. Furthermore, destruction of the cerebrum in any of these forms does not drastically reduce the animal's simple sensory capacities. Findings of neuroanatomists would not lead us to suspect that the decerebrate vertebrate is totally blind, anosmic, deaf, or deprived of somatic sensitivity. If after removal of the cerebrum the animal can see, hear, taste, smell, and feel, as well as execute all of the overt re-

sponses necessary to reproduction, why does extensive injury to the forebrain seriously interfere with, or completely abolish, reproductive behavior? An attempt to answer this question involves consideration of the general effects of forebrain injury upon reproduction in vertebrates of different classes. Certain effects found in several classes give some indication as to the function of the forebrain in reproductive behavior.

One of the most widely observed results of extensive forebrain lesions upon reproductive behavior throughout the vertebrate scale is the tendency for such brain injury to result in complete or partial disintegration of the pattern of response. All discrete elements in the pattern may survive after operation, but the spatial and temporal organization of their serial execution is lost. General recognition of this effect is reflected in the writings of several investigators. Noble (66, 72, 73) concluded that the forebrain is essential to organization of the pattern of reproductive behavior in several species of fish. Rogers (79) suggested that the forebrain "ties together" the discrete acts involved in the courtship and mating behavior of the pigeon. Beach (14) noted disintegration of the maternal behavior pattern in rats suffering cortical destruction. Bard (10) concluded that nervous mechanisms above the bulbospinal system elaborate and integrate the phasic elements in the copulatory behavior of the female cat.

A second result of forebrain injury may be the elimination of one or more of the specific elements in the behavior pattern. In most cases the evidence is against localization of function within the forebrain. Various elements in the courtship and mating of cichlid fishes may be eliminated by extensive forebrain removal; but different lesions may produce the same defect. Pursuit and clasping of the female by the male frog can be eliminated by ablation of all forebrain tissue including the preoptic area but not by restricted lesions in the forebrain; and the forebrainless male will execute many other elements in the mating pattern with normal vigor and precision.

Although there has been some attempt to localize within the forebrain of the pigeon certain areas responsible for specific elements in the reproductive pattern, the most impressive aspect of experimental work with birds is the indication that the number of behavioral elements eliminated is a function of the amount of cerebral tissue removed. In the maternal behavior of the rat various elements may drop out after extensive cortical invasion. The

elimination of separate segments of the pattern is a function of the amount of cortex removed rather than a specific locus of the lesion.

A third effect of forebrain injury upon reproductive behavior of vertebrates is a definite reduction in the operated animal's excitability. In some cases this effect may be traced to interference with the interaction between different brain regions. There have been no tests to determine the sexual excitability of male or female fish suffering injury to the forebrain. It is possible that the absence of courtship and spawning in forebrainless fish is due to greatly lowered sexual excitability consequent to brain injury. Somewhat comparable indications are found in some data on amphibia. In the male frog neither the forebrain nor the preoptic area is essential to pursuit and clasping of the gravid female. Separate elimination of either of these brain regions does not affect such behavior. However, combined destruction immediately eliminates the male's ability to pursue and clasp the female (save in the special case of tactile stimulation). Forebrain removal reduces responsiveness to many types of stimuli. Destruction of the preoptic area involves injury to the anterior commissure which carries olfactory fibers to the forebrain. Deprived of part of its fiber supply, the activity of the forebrain is markedly reduced, and this reduction is reflected in the frog's lowered excitability.

Studies on the copulatory behavior of male rats deprived of varying amounts of neopallium strongly suggest that cortical tissue contributes to the mediation of sexual excitability without contributing directly to the overt mating pattern. This effect apparently depends upon the elimination or reduction of the possibility for cortically mediated intersensory summation and facilitation.

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PSYCHOLOGICAL EXAMINING IN THE UNITED STATES NAVY: AN HISTORICAL SUMMARY¹

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In the classic Memoir Number 15 of the National Academy of Sciences, which describes in great detail the history of the Army testing program under the direction of Dr. R. M. Yerkes (57), no mention is made of the Navy. This omission is understandable, but the fact that the method was not used in connection with the enlistment of naval personnel is surprising. However, the implication of Yerkes' (56) report to the National Research Council is that, with the exception of Raymond Dodge, no work was done by psychologists for the Navy during World War I. It had been my belief, perhaps due entirely to ignorance, that no kind of psychological examining had been used by the Navy. Upon going on active duty at the Naval Medical School in October, 1940, in connection with a program of clinical psychology as a part of a broader psychiatric program in recruit selection, I undertook to search for possible earlier work. To my surprise I found that a number of medical officers had devised intelligence tests and that at least three of these had had wide application. None of these tests are mentioned by Hildreth (20), and it seems likely they are relatively unknown to psychologists. My own interest has suggested that an historical note might be welcome.

This summary has no claim to absolute completeness; the files of the *Naval Medical Bulletin* have been carefully searched, the *U. S. Naval Institute Proceedings* have been sampled, and a few publications elsewhere have been considered, but it is quite possible that an important paper has been overlooked. Furthermore, consideration is limited to papers dealing directly with psychological examinations. Articles such as those of Bieg (5), Durr (16), Taussig (48), and Thorpe (52) during the World War, and of Henning (19), Thom (49), and Cottle (10) at a later date, are interesting analyses of naval personnel problems having a psychological significance, but as they do not involve examination methods we will not consider them.

The bulk of the material found has to do with measurement of

¹ The opinions expressed are those of the author only and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

intelligence of recruits. History methods are frequently alluded to, especially in connection with more specifically psychiatric examinations. Finally, there are a few instances of reports on psychological methods being used for particular kinds of selection.

RECRUIT SELECTION

As early as 1912 Lowndes (25) remarks that "much has been written of late concerning the mental examination of the recruit," although he does not cite references, and he personally doubted the value of such examinations. The following year Schier (34) reported on the use of the Binet-Simon scale in the detection of feeble-mindedness among recruits, and during the next decade there were a number of comments on the use of this test in recruiting. Stokes (46), Bostick (7), and Sheehan (38, 39, 40) agree that, while the Binet scale gave *a priori* promise, it was not well adapted to service use because of its length, indefinite findings, variations among examiners, and similar criticisms. Ratcliff (30) reports that the test was used in a psychiatric study of 1500 men and served to detect men of inferior ability. Goddard (18) describes a short form of the Binet, including three or four items in each year from X to XVIII, but he gives no indication that the scale was ever used in the Naval Service. The primary purpose of the Binet and of the tests about to be described was the elimination of mentally deficient recruits. Nearly all of the authors preface the description of their test with a discussion of the dangers of admitting mentally subnormal men to the Navy. This was, of course, one of the first interests of the psychological examining in the Army, but apparently wholesale examinations were not made in the Navy until some years after the War.

Special Examinations

I have found nine papers describing tests which were actually used in the Naval Service. While some of these tests were given to relatively large groups of men, the data are usually inadequately reported, and the details are now of historical interest only. It is pertinent, however, to describe the tests briefly to indicate the efforts that were made.

The earliest test was published by Butts (8), who acknowledges the help of S. I. Franz and says that the test was used with 528 Navy and Marine Corps personnel at St. Elizabeth's Hospital. His special mental examination included the following six tests: (1) remote memory by re-

call of facts of history, geography, etc.; (2) brief delayed recall: subject is told a brief statement, *e.g.* an address, and warned that he will be asked for it in five minutes; (3) mental arithmetic including computation and simple problem-solving; (4) reading and report: three stories are read to subject and he is asked to reproduce them in his own words; (5) reasoning and judgment: giving differences and meaning of proverbs; (6) ethical questions.

Schier (35), who in 1913 reported on the use of the Kuhlmann-Binet in Marine Corps recruiting, in 1914 published an original test utilizing Binet items. The 10 items in his scale were: (1) repetition of seven digits; (2) drawing designs from memory; (3) sentence-building from three words given; (4) oral computation; (5) Healy puzzle A; (6) definition of abstract words; (7) recognition of absurdities; (8) problems of fact; (9) reading and report; (10) reversing clock hands. Passing of 7 of these items was taken as the acceptable minimum. His data showed that a group of normals passed an average of 8.78 tests while a group of institutionalized feeble-minded passed only 4.72. In a later paper Schier (36) proposed a system of point-scoring in order to allow partial credits for each item. However, in 1917 he reported (37) an experimental comparison of the two scoring methods and concluded that his earlier minimum of 7 passes was more practical than the point method. Thomas (51) examined 300 prisoners at the Portsmouth Naval Prison with the Schier test and also concluded that the 70% standard was satisfactory. In an earlier paper Thomas (50) reported the examination of 3000 prisoners and 100 Marines. Of the former, 28% failed while only 12% of the Marines failed. He also found a definite relation between military efficiency ratings of the Marines and the Schier test scores.

Jenkins (22) says that the Schier test was used during 1914 at the Naval Disciplinary Barracks, Port Royal, South Carolina. He, however, later made modifications which are described in this paper. Items 1 to 4 and 6 to 7 given in the Schier list above were used; the Seguin formboard was substituted for Healy puzzle A; and the following new tests were added: inkblot, Knox moron test, counting forward and backward from 1 to 20, imaginary situations, and syllogisms (reasoning problems). His scoring standard was 9 passed; his normal group passed 10.9 items, and a feeble-minded control group passed only 6.6 items.

McMullin (27) describes a test used at the Recruiting Office, Buffalo, New York. This test included six items: repeating of seven digits; sentence-building using three words given; differences between president and king, or definition of abstract words; simple opposites; code (not from the Binet); and drawing designs from memory. The scoring standard was 70% passed.

Goddard (18) says that Professor Mellville had examined 17 men at the Seamen's Barracks, Philadelphia, with a scale of 12 items, of which 11 were from the Binet. No further information about this test is given.

Bisch (6), in an extensive report on neurological and psychological examinations given at the Naval Operating Base, Hampton Roads, Virginia, describes a very short test and a unique method of administration designed to conserve time. His test items were: Knox cube, three to six

digits backward, Healy puzzle A, and Binet comprehension questions. For administration of the series five yeomen were used. The first man took a brief history, and each of the other four gave and scored one of the tests. Thus, five men were being examined at one time with an average time per man-test of three minutes. The scoring was based on a point system with a maximum of 84. Two samples of 1000 recruits had average scores of 51.41, and a group of 1000 men from an armed guard outfit had a score of 58.71. The critical lower minimum was determined to be 30. The scores gave a correlation with the man's own claim of amount of schooling of $r=0.35$. McDaniel (26) very briefly reported data on approximately 13,000 men examined with this test at the Naval Training Station, Hampton Roads, during 1918 and 1919. The average score was 49.14.

In an anonymous note (1) in the "Queries" section of the *Naval Medical Bulletin* the editor says that he received simultaneously a request for information regarding psychological tests for recruiting use (this in spite of all the earlier literature) and a test suggested for this purpose. This test included digits forward, a simplified code test using only the first figure of the Binet code, the Knox cube, and a series of orientation and information questions. No indication is given that this test was ever in actual use.

Poppen (29), writing on mental selection in recruiting service, says that tests based on education are unsatisfactory and that naval personnel should be better than average. He describes a five-item test which had been administered to 278 applicants. Of these, 74.1% passed; of those who failed, 15 were rejected on the mental ability basis alone. Without the use of the test only 2 of these, 15 men would have been detected. His five items were: repeating digits backward, difference between president and king, problems of fact, and arithmetic problems—all from the Stanford-Binet—plus the Knox cube.

The final test described is by Stearns (45), whose system of selection on essentially psychological grounds is particularly worthy of attention. In three papers in 1918 Stearns reported his experiences in the psychiatric examination of recruits. In one paper (42) he cites a number of brief cases illustrating the value of his history method; in another (43) he gives data from 2000 examinations. In this paper he says: "Psychologic methods were considered and rejected for two reasons: First, they are too cumbersome. Second, the application of the findings is not specific enough, and applies largely to the feeble-minded group." In spite of this statement he reported in 1919 (44) his method of classifying recruits. This method is described at greater length in his 1924 paper, although there are more detailed data in the earlier one. The method utilizes four areas: physical fitness, mental capacity and health, formal education, and industrial training. The final ratings do not include the first of these because the Navy Regulations do not recognize any condition of partial physical fitness. The other three are given scores between 1 and 4 on a specifically described basis; in addition, a list of 53 trades or occupations of significance in the Navy are numbered. The rating for a man might read 444.4, which would indicate a man of superior intelligence, college educa-

tion, professional occupation, and specifically a lawyer. Another might be 434.38, which would indicate a man of superior intelligence, high school education, having a skilled trade, a photographer.

The mental test upon which the rating for intelligence was based included: the Trabue Scale C (sentence completion), dissected sentences from the Binet, cancellation of "e" from a prose passage, memory span for digits (5, 6, 7, and 8 digits given), and the Healy code. The scoring was on a point basis with a maximum of 100. The distribution curve for 4000 cases (44) is decidedly asymmetrical, with an excessive number of cases having scores between 65 and 95. Wickes (55) gave this test with the exception of the code to 3020 recruits at the Newport Training Station between March and November, 1924. He reports the same skewed distribution of scores as was found by Stearns. Further, he points out as sources of error the disturbance on first arrival at the Station, inaptitude of examiners, cribbing, and the effect of poor performance on the cancellation test. An anonymous writer (2) reported the administration of the test to 731 midshipmen in the fourth-year class at the Naval Academy during the year 1922-1923. There was a progressive increase in the percentage of academic failures during the first year with decrease in score.

It is to be noted that all of the tests mentioned (except those by Goddard) were devised by Naval Medical Officers. All of the tests were serviceable for the specific function of eliminating the mentally subnormal. It is to be regretted that the authors did not present more adequate data. The dependence of all these efforts upon the Binet tests is indicated by the fact that of the 36 different items used exactly one-half were from the Binet, and of the 56 items including duplicates 33 were from the Binet series. All of these tests except that of Poppen (29) and that of the anonymous writer (1) were utilized during the activity of World War I. Since the paper of Stearns in 1924 there have been no further descriptions of intelligence tests in the *Naval Medical Bulletin*, although very recently Bell (4), writing on recruit selection, intimates that observation of the man's adjustment to his environment is of greater importance than his performance on psychological tests. It is interesting also to note that these descriptions of tests were all essentially independent of each other; reference to earlier descriptions is the exception rather than the rule. In no place is there any indication that any method was used in a general way in the Service.

One indirect method proposed for measuring intelligence should be noted. Hunt (21) felt that there might be a differential in performance time on the Jennings self-recording color test related to intelligence. He tested this hypothesis on 500 recruits and an unspecified number of children and institutionalized feeble-minded

who were classified into several ability groups by means of the Stearns test. While there was some indication that a higher percentage of superior subjects took less than 85 seconds on the color test, the differences were not great enough to prove meaningful, and so the method was abandoned.

Further discussion of the use of psychological tests in recruit selection is to be found in the annual reports of the Bureau of Navigation (53) from 1923 to 1930 and in the Secretary of the Navy's annual reports (54) from 1931 to 1933. That for 1923 reports that a Training Division had been established in the Bureau of Navigation on March 1, 1923, and that "steps are now being taken to provide tests for use in selecting candidates for the various schools in order that unsuitable personnel may be eliminated" (p. 221). The 1924 report indicates that the Division had been experimenting with tests, that a general classification test had been evolved, and that it had demonstrated its usefulness in selecting men for schools. In 1925 there is a somewhat more extensive discussion of these tests with data from a special study of 1000 men who had been in service about one year. Of these, 218 had been separated from the service (desertion, bad conduct, undesirable, medical survey, etc.) within the year, and their average score was 52.7; 445 had not been advanced from seaman second class, and their average score was 54.4; while the 337 men who had advanced at least to seaman first class had an average score of 68.3. Further, it was shown that advancement was secured by 42% of men having scores over 50, but by only 17% of those with scores lower than 50. The 1926 report refers to a study of 948 men examined at one station which found that the use of the test reduced the percentage dropped for inaptitude from 20% to 1% (see Jones, 23). Brief reference is made to the tests in the annual reports for 1927 to 1929, and in the later year for the first time the report of the Recruiting Division mentions the higher quality of men being recruited as shown by the test results.

The indications are that this general classification test had been given at Training Stations after the men had been recruited. Apparently a change was instituted about 1931, and the test was given at Recruiting Stations. This can be deduced from the data shown in Table I, which has been compiled from material in the

TABLE I

GENERAL CLASSIFICATION TEST SCORES OF RECRUITS

Year	Per Cent of Scores		Year	Per Cent of Scores	
	Below 50	Above 50		Below 50	Above 50
1926	28.4	71.6	1930	17.3	82.7
1927	27.6	72.4	1931	5.1	94.9
1928	22.3	77.7	1932	2.8	97.2
1929	19.2	80.8	1933	0.7	99.3

1930 annual report (up to 1930) and the Secretary's reports from 1931 to 1933. The very sudden drop in the percentage below 50 evident in 1931 would indicate that a minimum had been established and that men were eliminated at the Recruiting Stations. The Secretary of the Navy's annual report for 1931 to 1933 gives the average scores of recruits for these years as 78.3, 77.7, and 81.8, respectively. It is interesting to note that this last average score is equivalent to an Otis IQ of 103.

While the discussions in the annual reports chiefly refer to the general classification test, there are indications that similar work was being done with educational and trade aptitude tests. It is therefore amazing to read an article by Lincoln (24) in which, in

TABLE II

GENERAL CLASSIFICATION TEST SCORES OF PETTY OFFICERS

	Number	Average
Seaman (boatswain, gunner, quartermaster, etc.)	128	68.3 (66.0)
Artificer (deck) (electrician, radio, carpenter, etc.)	94	78.4 (66.1)
Artificer (engine) (machinists, watertender, smiths, etc.)	199	62.8
Special (yeomen, storekeepers, pharmacists)	35	80.0
Commissary (ship cook, baker)	25	45.6 (49.6)

apparent ignorance of everything that was being done, he suggests the great value of aptitude testing for recruit selection and proposes that the O'Conner tests be used. These, he says, would require only about two hours examining for each man!

Rowcliff (33) reports a study of the scores on the G.C.T. made by men at a Training Station who were selected for trade schools. These show that while the average for all men was 65.5, the average for the various trade groups ranged from 71.6 to 83.5 except for small groups of musicians and buglers, who had averages of 67.6 and 50.9, respectively. The author calls attention to the fact that with such selection there is "the consequent lower standard of intelligence of the remainder which goes aboard ship to become available for all other ratings." Rowcliff also examined 481 petty officers aboard three ships and presents the average scores for various ratings. The average scores for five large branches of the service are given in Table II. Apparently the averages published by the author are in error or at least do not agree with averages calculated from his published data. The author's published averages are given in parentheses where they differ from the recalculations.

OFFICER PERSONNEL

I have been able to find only two references, in addition to the anonymous note (2) mentioned above, which are concerned with the psychological examining of officer personnel. Craven (11), discussing the "selection-up" and "selection-out" of officers, proposes that, while psychological tests should not be used for admission to Annapolis, there should be a carefully arranged series of tests used during the course of the entire four years. Similar tests should be given to junior officers, and furthermore the officers' fitness reports should be changed under the direction of a psychologist. Craven does not offer any specific suggestions as to the types of tests to be used.

Rooks (32), in describing the entrance procedures for the Naval Academy, says that careful study had been made of the usefulness of psychological tests at the Academy, and it had been decided they were impracticable because (1) they do not measure "innate intelligence," (2) the chief claim that can be made is that of economy and simplicity, (3) their predictive efficiency is not large and not superior to the entrance examinations in use. Data are given for classes of 1930 to 1933, and it is shown that consistent use of the Otis S.A. test would have eliminated only 27% of the 416 men who failed.

AVIATORS

The earliest paper reporting the use of psychological methods in the selection of naval aviators which I have found is by Bachman (3). While devoted primarily to the physical examination, there are a few pages devoted to psychological tests. The methods used included reaction time (details not given), judgment of length of rods, of speed of revolving discs, and of time of sand running in a glass, and a simple jigsaw type of formboard. The author says his crude tests showed some value, but they need refinement.

In the same year Parsons (28) particularly criticized the dependence upon physical condition in the selection of aviators and emphasized the necessity of considering such psychological factors as intelligence, emotional control, dependability, persistence, etc. He asked the judgment of aviators as to the characteristics desired in airplane pilots and secured unanimous agreement on intelligence, good muscular coördination, keen equilibrium sense, and good judgment of velocity and distance; general agreement was found for temperamental stability and physical strength. On the

basis of these findings and with the advice of L. E. Troland and H. E. Burt he developed a battery of tests as follows: (1) coolness: rapid addition with a record of pulse and respiration, interrupted by a sudden stimulus; (2) alertness: reaction time to visual, auditory, and tactual stimuli; (3) muscle coördination: execution of described movements rapidly; (4) mental alertness: time required to read words with reversed spelling; (5) judgment of distance using a moving object; (6) observation and report; (7) fear of flying using word association; (8) equilibrium reaction time to tilting; (9) ergographic tracing; (10) intelligence test, using the "Troland-Pressey machine." Rather extensive data on 74 subjects are given for all tests except 5, 8, 9, and 10. Of the remaining six tests the first and seventh made adequate differential selection of good and poor aviators; the others he advises abandoning.

Rhoades (31) discusses the importance of determining personality characteristics in selection and describes a history interview method. He mentions specifically the use of reaction time measurements in word association and by means of the domino test.

Sutton (47) and DeFoney (12, 13) report at some length under the title "Psychology in aviation" on a method of examining for personality characteristics by means of a personal interview technique. The specific details of the method are not presented in any of these papers, but Sutton describes it as involving the securing of family and personal history in a one-hour interview. The examiner rates the responses on a four-point scale. The final score is based upon ratings for intelligence, responsibility, reaction time, judgment, stability, memory, and attention. The method is essentially clinical in nature and rests upon the examiner's subjective insight. For example, Sutton says that the subject is trying to make the best impression possible; therefore he may try to give what he believes are the most acceptable answers. In so doing there may be obviously lengthened reaction times in answering, especially if the man's responses are not strictly accurate. Such hesitance is considered in making the ratings.

DeFoney, in his two papers, presents validating data for the method. The first paper reports data on examinations and later flight training history for 628 men, and the second on 677 additional men. The findings of the two reports are in essential agreement. The data presented are extensive, and we can give only the final summary. From the total group of 1305 men 479 were selected by the test as good material. Of these, 77.6% qualified and

22.4% failed to qualify. Of the 826 men who were judged poor material by test, only 32.5% qualified, and of these an appreciable number required additional training hours in order to qualify. It is also important to learn that the good material had a crash rate of 0.2, while that of the poor material who qualified had a rate three times as great, viz., 0.65.

MISCELLANEOUS

Raymond Dodge (14, 15), working with the Navy, devised selection and training methods for "gun-pointing, fire-control plotting, anti-submarine listening, and the lookout service" (14). None of these are described in detail, but the gun-pointing problem involved measurement of visual perceptual time and accuracy, and motor control. The tests for fire-control plotting included "the ability to repeat clearly by telephone, a series of ordinary commands that were received by telephone, the ability to remember and repeat numerals, to read a circular scale, to read a plotting scale and to lay off distances to scale, together with neatness and accuracy in drawing and sub-dividing simple geometrical figures" (15).

Galbraith (17) describes a test for selecting enlisted personnel for a listener's school which may be similar, if not identical, to that devised, but not described, by Dodge. Galbraith's battery included: memory span, reading degrees from a circular scale, localization of a concealed sound, discrimination of familiar sounds, and plane localization of binocular sounds.

Jones (23) presents results on the use of the "O'Rourke Intelligence Test" in the selection of submarine personnel. A critical score of 45 was determined, and the use of the test reduced dismissals for inaptitude from 20 to 1%.

SUMMARY

This paper represents merely an historical account of psychological examining that has been carried on in the Naval Service. It has significance for psychologists because most of these reports have been entirely missed by psychological bibliographers. Perhaps the most surprising findings from this survey are the relatively large number of reports and the almost complete lack of coordination among the several authors.

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PSYCHOLOGY IN WESTERN HIGH SCHOOLS

BY LLOYD BERG AND WARNER BROWN¹

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Several studies have been made of psychology in secondary schools; these are listed, so far as we could discover them, at the end of this paper.²

Our first inquiry was addressed to the superintendents of schools in cities of 10,000 or more (some smaller cities in sparsely populated states) in 22 Western and Midwestern states. No attempt was made to compare regions. Even within this one area our data are incomplete; we found a course in one or more public high schools in more than a fifth of the cities canvassed, but we do not know how many more there may be. Our primary purpose was to obtain information about the course itself.

TABLE I

States	No. of Cities Addressed	No. of Superinten- dents' Replies	No. of Schools Found	No. of Schools Replying	No. of Teachers Reporting
	Total 247	Total 136	Total 70	Total 61	Total 70
Arizona	6	2	0	—	—
California ³	—	—	8	8	9
Colorado	7	2	0	—	—
Idaho	5	3	1	1	2
Illinois	25	9	2	2	2
Indiana	16	8	2	2	2
Iowa	16	9	6	4	4
Kansas	23	15	11	7	7
Michigan	18	11	2	2	2
Minnesota	10	6	0	—	—
Missouri	11	5	11 ⁴	9	13
Montana	4	4	0	—	—
Nebraska	11	6	2	2	2
Nevada	2	1	0	—	—
New Mexico	7	4	1	1	1
North Dakota	5	2	1	1	1
Ohio	33	17	9	8	9
Oregon	5	4	0	—	—
South Dakota	5	3	1	1	1
Utah	5	5	6	6	6
Washington	11	7	3	3	3
Wisconsin	18	11	3	3	5
Wyoming	4	2	1	1	1

As shown in Table I, the preliminary inquiry was sent to 247 superintendents, of whom 41 said that psychology was offered in their schools, 95 said it was not, and 111 did not reply.¹ From the 41 positive replies and from other sources, 70 schools were found which were offering a course in psychology in the Spring of 1940. Their location, by states, is shown in the third column of Table I.

A questionnaire was then sent to teachers in these 70 schools, and replies were obtained from 70 individuals representing 61 schools. Not all questions were answered by all teachers or for all schools, but the omissions were few and do not cloud the picture significantly. What follows is an attempt to summarize the information given by these 70 teachers of psychology.

THE SCHOOLS AND THE COURSE

The schools range in enrollment from 150 to 3600; mean and median, both 1200. There is usually only 1 teacher of psychology, but seven schools have 2, one has 3, and two have 4. The number of classes per teacher per annum is usually 2, but in six instances it is from 7 up to 10. The total number of pupils taught per teacher per annum ranges from 20 to 420; median, 85. In only four instances does the course continue for more than one semester. In two-thirds of the schools it is a twelfth-grade (senior) course; in the remainder it may begin in the eleventh year, but not sooner. Credit is given in every case but one. As a rule it is elective, but is required in two schools. In some of the schools psychology has long been a part of the curriculum: in one school, 48 years; in one, 29; in eight, from 20 to 25; median, 10 years.

In response to the question, "What is the appeal of psychology to students? much, little, none," there are 2 failures to answer, 5 qualified answers, 2 answer "little," and the remaining 61 check "much." In this connection it may be noted that among the 95 superintendents whose systems do not offer psychology 13 reply

¹ The late Lloyd Berg, of Idaho, initiated this study and collected the data while a graduate student at Berkeley. Warner Brown is responsible for the form of the present article.

² We are indebted to Professor C. P. Stone, who gave us access to some of this material.

³ Questionnaires were not sent to California superintendents because the information was available in the *California School Directory, 1939-1940*.

⁴ Nine in Kansas City.

⁵ We wish to acknowledge the generous coöperation shown by the school officials and the teachers who replied to our inquiries.

to the question, "Is there a need or demand for such a course?" with a categorical "yes," while 19 others are doubtful or think there is a need but not a demand.

THE TEACHERS

A Master's degree is held by 51 (73%) of the teachers; Bachelor's only, 16; Ph.D., 2; answer unintelligible, 1. College majors were: psychology, 18; education, 19; social sciences, 21; English, 8; science, 8; all others, 7. All but one of the 70 teachers answered about college work in psychology: 10 had had 10 or less semester units; 26, from 11 to 20; making a total of 37 (over half) who had taken 20 or less units. The median and mode are both close to 15 semester hours. The range of teaching experience is from 2 to 42 years; the median is 18; the average, half a year less. Some 12% teach no other subject; 39%, one other; 27%, two others; 22%, three others. The commonest combinations are with history (13), English (10), and economics (9). The combinations with some social science (40) are more than twice as frequent as those with a science (including mathematics). More than two-thirds of the teachers are men. Only one is affiliated with the American Psychological Association, but two others have been in the past.

TEXTBOOKS

Six teachers use no textbook. The remaining 64 mention 21 texts, and, as some of them use more than one book, there are 76

TABLE II

TEXTBOOKS

	S	P	U	Total
Robinson	5	20	3	28 ^a
Ruch	5	5		10
Uhl & Powers	1	4		5
Morgan & Gilliland	6	1		7
Wheatley & Mallory	2	1		3
Morgan (<i>Sound mind</i>)	3			3
Bennett	1	2		3
14 Miscellaneous	2	8	7	17
	<hr/> 13	<hr/> 49	<hr/> 14	<hr/> 76

entries distributed into "entirely satisfactory" (S), "partly satisfactory" (P), and "unsatisfactory" (U), as shown in Table II.

^a Eleven of these 28 are from Kansas City.

Among the 14 books included under "miscellaneous" no one is mentioned by more than two teachers.

METHODS

All but two of the respondents use supplementary reading material, and all but four say "Yes," they "color the material with other facts" (from sociology, economics, etc.). All the teachers use class discussions; 77% lecture; 74% use "experiments"; 40%, "case studies"; 50%, "projects."

CONTENT OF THE COURSE

A check list was provided which contained 31 names of topics. The ones most frequently checked as "among the 5 most emphasized" are:

Personality (development, improvement)	44
Feeling and emotion	30
Social behavior (culture, social activities)	25
Motivation (drive, desires, and goals)	24
Habit	24
Mental hygiene	23
How to study	21

Some topics—"criminality and delinquency," "abnormal psychology (feeble-mindedness, mental disorder)," and "imagination"—are emphasized by no more than one of these teachers.

SUMMARY

A high school course in "psychology" is offered in more than one-fifth of the Western and Midwestern cities canvassed. The course is nothing new; it may have been in existence for a decade. The school is likely to be a large one. The course is for a single semester, usually in the last year. It is elective and credit is given for it. A textbook is used with which the teacher is not entirely satisfied. There are discussions, lectures, outside reading, "experiments," and often "projects" and "case-studies." The major emphasis is on personal and social adjustments, motives, and emotion. The teacher is more often a man than a woman, is likely to be a veteran of 15 or more years teaching experience and to have a Master's degree. He has probably had four or five courses in psychology in college. He specialized in psychology or education or a social science, rarely in science. His one psychology course each semester is not his main job; he teaches English or one of the social

sciences—less frequently, a science; nevertheless, in six cases out of seven he thinks the psychology course has “much appeal.”

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PREDICTING THE CHILD'S DEVELOPMENT

I

DEARBORN, W. F., & ROTHNEY, J. W. M. Predicting the child's development. Cambridge: Sci-Art, 1941. Pp. 360.

Those interested in forecasting the mental or physical growth individual children will find *Predicting the child's development* disappointing. They will approach the book expecting it to furnish them with media for dealing with such questions as it was announced to answer: "How tall will this lad of 5 be at the age of 14?" "When will this little girl experience the first signs of womanhood?" The first chapter will sustain their anticipation of predictive devices, though they will become uncertain regarding both the age intervals over which prediction is possible and the frequency with which reasonably accurate predictions can be made. According to this chapter, (a) for a few children as young as 9 or 10 years, there is a possibility of "prediction of the age at which sexual maturity will likely be attained" (p. 41); (b) "while a paralleling or railroad tracking" of individual stature curves for the years 7 to 18 "is the rule, there is some 'crossing of the tracks'" (p. 42); and (c) for curves of mental growth, "consistency is here again the rule," though "clear-cut crossings of the growth curves" occur and "'constancy' of physical size is undoubtedly much greater than the constancy of the I.Q." (pp. 43; 48-49). The chapters which follow will progressively shatter their expectation of becoming acquainted with procedures for forecasting development. Findings are presented from varied analyses of child development data which indicate, and successively reiterate, "the hazard of prediction" (p. 232). In Chapter IV, the authors state: "Our findings and experience with the individual growth data do not seem to offer much promise of reliable prediction in the individual case" (p. 232). In their "Summary and Conclusions" the following statements are made: "We have established the fact that variability rather than consistency in growth is the rule . . ." (p. 346). "Physical and mental growth are essentially individual affairs" (p. 341). "Prediction of growth at various ages is extremely hazardous, . . . particularly so during the period of adolescence" (p. 342). (To the reviewer, it is incongruous, though unequivocal, that the book begins on the note "consistency" in physical and mental growth "is the rule," and closes on the note "variability rather than consistency in growth is the rule.")

The content of *Predicting the child's development* is based upon "an investigation of mental and physical growth which has come to be known as the Harvard Growth Study" (p. 58). The Study was inaugurated by Professor Walter F. Dearborn, the senior author, and carried on under his direction through "the Psycho-Educational Clinic of the Harvard Graduate School of Education" (p. 34). Collection of data began "in the fall of 1922," when approximately 3500 school children residing in "three cities of the metropolitan area of Boston were examined" (p. 34). "Most of the children were in the first grade and most were at ages 6, 7, and 8 years. The plan of the study required that these children be measured annually over a period of twelve years in respect to a number of characteristics," e.g. intelligence, educational achievement, body size, eruption of teeth, ossification of hand. Since the data were accumulated at a set series of schools, there was a gradual loss of subjects: "At age 10, one quarter of the original population were lost from the study,—at age 15, fifty per cent was lost, and at 17 three quarters . . ." (p. 71). Amassing of data was terminated in 1935, a total of approximately 200 graduate students in psychology and education having been "employed during the progress of the study" (p. 64). In this latter connection it is pertinent to mention that the Study had "two main objectives": "fact-finding" and "student training" (p. 66).

It will no doubt be confusing to many readers that the word "prediction" is used with other meanings than that of forecasting a child's status regarding some trait—or combination of traits—at a later age.

(1) It is used when referring to the relationship between traits at a given age. For example, a study on 233 sixteen-year-old boys is reported in which a multiple correlation coefficient of .25 was obtained, expressing the association between intelligence test performance and a combination of five body measurements. The authors state: "Prediction of test score on the basis of physical status would be successful in such a few cases that it would not be worth the effort" (p. 271). And again: "The relationship between the physical measurements and the mental measurements is so low that the knowledge of one does not enable us to predict the other" (p. 341). (2) It is used with reference to the "normal" or "satisfactory" body weight for a given child at a particular age. The authors report they have devised "a rather good equation for the prediction of normal weight for sixteen-year-old boys" (p. 305). The equation estimates body weight from a "weighted combination of chest depth, chest width, standing height and iliac" width (p. 303). Since the equation is interpreted as yielding "what an individual should weigh" (p. 309), "prediction" be-

comes synonymous with evaluation—with appraising an individual's weight status as satisfactory or unsatisfactory.

One of the major "practical outcomes inherent in the data and studies which comprise this volume" is stated as follows: "... it has been found that maximum growth ages present a practical means of classifying adolescents" (p. 57). This question arises: In what sense and for what purpose is it *practical* to classify adolescents according to age of greatest gain during the period 7 to 17 years of age? In the case of stature—the measurement suggested—occurrence of maximum gain varies from the tenth to the fourteenth year for girls and from the thirteenth to the seventeenth year for boys. At age 11 for girls and 14 for boys (one increment beyond the maximum being needed to indicate it has been attained), it would be possible to classify "adolescents" into (a) those few for whom the maximum is known to have been reached and (b) the remainder. Not until age 15 for girls and 18 for boys could the normal gamut of teen-age individuals all be assigned to "maximum growth age" categories. The "practical" value of classifying individuals 15 (girls) and 18 (boys) years of age in terms of a phenomenon which characterized them from one to six years earlier is neither made apparent nor specified.

On page 37 the authors state that maximum growth ages "coincide" with "the advent of the menarche in girls and of pubescence in boys. . . ." However, for girls, (a) the available research shows a systematic tendency, particularly marked in those with menarcheal ages later than average, for age of maximum acceleration to *precede* age of menarche,¹ and (b) considerable fluctuation in the timing of the two events is indicated by a statement found on page 145: "Ages at which individuals attain their maximum growth increments correlate .702 with menarcheal ages." For boys, the expressed relation between accelerated growth and "pubescence" appears not to be founded on any data for the latter. The authors state: "Shuttleworth has shown that the ages at which maximum growth occurs are . . . indicators of sexual maturity in boys . . ." (p. 40). Shuttleworth has not *shown* this; he has merely

¹ Cursory reading of the McGlinchey study reported on pages 162-168 may appear not to confirm this. However, careful examination will reveal that (a) McGlinchey utilized no cases with menarcheal ages later than 14.5 years, and that (b) her age of "highest peak" refers to the individual's stature rankings and frequently represents a later age than that of the "maximum growth spurt" with which it is erroneously identified.

suggested that it is "not a violent assumption to suppose that age at maximum growth is at least as good an indicator of the timing of significant endocrine events as age . . . of sexual maturity in boys . . ." (see *Monogr. Soc. Res. Child Developm.*, 1939, 4, No. 3, p. 2).

It is noted that (a) portions of the data accumulated by the Harvard Growth Study have been analyzed by numerous investigators; (b) "approximately 10 books and 70 articles based upon the data of the Study have been published" (p. 65); (c) "it would not be possible to do justice to the studies which have been made in a volume of this length . . ." (p. 238); (d) "it is our purpose . . . to report only the recent studies . . . in which the advantages of longitudinal data are best exhibited" (p. 239); (e) "we shall refer to them . . . as they relate to the particular" topics discussed (p. 238).

One topic treated is "Consistency in Growth of Stature." Here the authors incorporate a 20-page review of an unpublished study by Grace McGlinchey, the primary purpose of which "was to determine the constancy or fluctuation of the standing height of 266 subjects in relation to the mean of the group as a whole" (p. 150). The subjects were girls, mainly of North European and Italian descent. In summarizing her findings, it is stated: "The most arresting observation made was that no two of the 266 cases had identical standard scores at each age from 7 to 17. There were many cases which were closely parallel in development, but none were exactly the same throughout. . . . The conclusion appears to be that physical growth is essentially an individual affair" (pp. 161-162). The study is appropriately included. Inexplicable, however, is the exclusion of reference to other studies which have employed Harvard Growth Study data, made analyses only possible with seriatim records, and reported findings which definitely relate to constancy of growth in stature. These include: "The prediction of stature of North European males throughout the elementary school years" (*Hum. Biol.*, 1936, 8, 279-283); "Individual trends for stature and anatomic age" (*Univ. Ia Stud. Child Welf.*, 1937, 12, No. 5, Part 2); and "Stature of Massachusetts children of North European and Italian ancestry" (*Amer. J. phys. Anthropol.*, 1939, 24, 301-346). The latter study, in particular, affords substantial findings for both females and males on "the form of individual stature curves" (pp. 319-326) and on "the stature rank of the individual at successive ages" (pp. 335-343).

There are numerous points at which more exact statement or greater specificity would minimize misinterpretation of the book's contents. To the examples already cited, the following may be briefly appended:

(1) On page 33 reference is made to an 1872 study by Bowditch: "Bowditch graphed the average measurements of the height of 12 males and 12 females made annually over a period of twenty-five years. He found evidence of growth increments up to that age." Actually, none of Bowditch's female subjects (13 rather than 12) were measured after 20 years of age, and none of his male subjects after 22 years.

(2) It is doubtful that the authors have evidence to support their statement: "Ordinarily accurate measurers may have periods when they repeatedly measure too high or too low" (p. 61). In its context, this statement appears to run counter to findings on the specific problem of anthropometric reliabilities and on the broader problem of the 'curve of error.'

(3) On page 84 it is stated: "During the first year, 18 anthropometrical measurements were made, but study of them revealed that some were not good indicators of development." The criteria against which such measurements as head girth and arm length were evaluated and found to be less adequate "indicators of development" than head width or chest depth are sufficiently pertinent to merit listing.

(4) In a paragraph headed "Critique of the Statistical Approach" one reads: "Statistical studies, in general, seldom contribute greatly to the understanding of the individual case. Why should one expect from studies of the growth *status* of different individuals to learn much about the growth *processes* going on within a single individual, or of the results of these processes?" (p. 276). It is not apparent why the authors regard statistical procedures as essentially applicable to cross-sectional data. Clearly, measures of central tendency and variability may be secured either for "status" data (e.g. weight values at a given age) or "process" data (values representing change in weight between two ages). Similarly, measures of relationship may be calculated either for status data (e.g. stature and hip width values at a given age) or for process data (values for stature on the same individuals at two ages). If the authors intended primarily to indicate that there were unsolved problems in the application of statistical procedures to longitudinal data, they neither made this evident nor provided the reader with an illustrative example.

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II

REPLY TO HOWARD V. MEREDITH'S REVIEW

BY WALTER F. DEARBORN

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The queries which are put in quotation marks in the opening sentences of the above review and which unfortunately seem to have determined the tenor of the whole critique are not to be found in the book, but in a prepublication announcement of the book. To give the publishers their due, and in contradiction of the reviewer's statement, it was not announced that these questions would be answered. At any rate, it would seem proper to confine a book review to what the book has to say. Further, it is to be noted that the title of the book is not a promise or even a wish fulfillment; it is a description of the chief *raison d'être* of this effort as of all methodological treatises.

If the reviewer is disappointed with the small accretions to the very limited existing means of prediction, his appetite must have been whetted beyond reason. One may be disappointed with the weather, but he has no right to take his disappointment out on the weather man. In a field in which great industry over a long period of years has produced so little (and in which the reviewer has, himself, toiled) it would seem reasonable to expect at least mention of some of the definite leads, if not accomplishments, in the direction of greater accuracy of prediction, which are to be found in the book. There is scarcely a word in the review as to the more constructive aspects of the study, such as, to cite a single example, providing the groundwork of a method for using the percentage of mental growth in terms of the estimated maximum growth of the individual, or of an unselected group, instead of the mental age and intelligence quotient technique. Such a measure may obviously have greater predictive value and greater reliability than the "I.Q." The word 'predictive' is used with different meanings, but they are obvious in their context. Interpretation of correlation coefficients in terms of forecasting efficiency is established usage.

As to the reviewer's second point of criticism, that the book begins on the note of consistency in physical and mental growth and closes on the note of variability, there is a close parallel in a recent and widely accepted general psychology which, after spending over 20 chapters in presenting what people have in common,

in the final section sets out to "emphasize differences" and concludes that every human being is unique and that "differences are the rule." It is partly a matter of interpretive emphasis; no hard and fast line can be drawn as to where consistency ends and variability begins. In contrast, and at the risk of seeming facetious, a recent poll (*à la* Gallup) of the occupants of the front-row seats at a musical comedy performance may be cited. Although there was evidence of attempts at preserving individuality and a count of the remaining hairs showed that no two heads had exactly the same number of hairs, the consensus of opinion was one of baldness.

In the present instance, although the introductory and the concluding chapters were written by two different persons, it was an inadvertency to have used the phrase "is the rule" for both consistency and variability, but there are no essential incongruities in the statements of findings throughout the book. The bald fact is consistency. The authors point out: (1) that physical growth is not as consistent as statements of certain authors of established reputation in the field have indicated, *e.g.* that "size at any age predicts size at all ages" and that "a reversal almost never happens" (p. 43); (2) that extensive samplings of individual cases show not infrequent crossings of the curves (p. 43); (3) that although in a sampling of 266 cases (p. 161) no two of the cases "had identical standard scores at each age from 7 to 17" and that thus, when every deviation is counted, physical growth appears "essentially an individual affair" (p. 162), yet when the sampling of cases is divided into six groups, "the fluctuation of each of these groups is orderly and consistent—there does not appear to be considerable group variation. On the contrary, the groups appear to be remarkable for the regularity of their fluctuations in the growth rhythm" (p. 153).

Similar findings are presented as to the constancy of mental growth as far as it can be estimated by intelligence tests. Over 40 individual growth curves are presented for the ages 8 to 16 to show how markedly variable the individual may be, yet the main finding remains that individuals "tend to remain throughout the period of their mental growth to age 16 in the same classification as they were at age 8."

The remaining points of criticism are either mildly misrepresentative, picayune, or both. The garbled quotation (excerpted with deletions from a paragraph on page 40 of the book)—to wit:

"Shuttleworth has shown that the ages at which maximum growth occurs are . . . indicators of sexual maturity in boys. . . ."—misrepresents the content of the passage. There are three statements in the paragraph which can be substantiated: (1) "Shuttleworth has shown that the ages at which maximum growth occurs are superior to menarcheal ages for the purpose of grouping together girls with similar growth patterns." (2) "He also presents evidence that they are as good, if not better, indicators of sexual maturity in boys than the various criteria, such as axillary hair, which have been previously employed." (3) "In view of the above findings and since now the same criteria may be used with boys and girls, it would appear that maximum growth ages (abbreviated as M. G. ages) provide a more practical and usable method for the classification of adolescent children than has hitherto been available."

On the very page of Shuttleworth's monograph from which the reviewer quotes (to prove that Shuttleworth has "*not shown this*," i.e. the garbled quotation), the following sentences are found in support of the above statements: (1) "For the purpose of grouping together girls with similar growth patterns these criterion ages are far superior to menarcheal ages." (2) "Further, our criterion ages are doubtless as good indicators of sexual maturity among boys as the criterion of axillary hair employed by Richey." (3) ". . . the criterion M. G.-ages, or ages at maximum growth, implied in this study are virtually universal in their application, they are highly reliable, and they provide a very excellent basis for the grouping of individuals with similar growth patterns. In addition they are good indicators of underlying endocrine events and of the attainment of sexual maturity. . . . Given the problem of describing patterns of physical growth during the second decade of life and given excellent indicators of the advent of sexual maturity, it is our considered judgment that classification of cases according to age at maximum growth is superior to classification according to age at sexual maturity." For the sake of brevity we will let these last citations also stand as an answer to the reviewer's query: "In what sense and for what purpose is it practical to classify adolescents . . . ?"

In reply to the criticism of the correlative study of McGlinchey, the following statements are made: (1) Since for 100 of the 266 cases selected at random for this study the date of menarche had been recorded, the growth data of these 100 girls were examined to note the relation between age of menarche and variations in

growth in height. In the absence of any evidence that a selective factor existed, the data used in the study were assumed to be a representative sample of the "population" involved. The objection, therefore, to the lack of cases whose menarcheal ages were later than 14.5 appears to be unjustified.

(2) It is to be noted that the growth curves are based upon the standard scores of the cases plotted in relation to the mean. Since this basic handling of the data has been explained, a description of the maximum fluctuations of these curves in relation to the mean as "highest peak" or "maximum growth spurt" should not have been misleading.

Reference to the reviewer's use of Harvard Growth Study materials is made in a footnote on page 238. The authors agree that a more extended notice of the reviewer's contributions would have been desirable.

As to the Bowditch report, the following statements are quoted from the proceedings of the Medical Society meeting at which Bowditch presented his "diagram": "... the measurements were all taken annually during the last twenty-five years," and "... growth went on, though slowly, to nearly twenty-five years of age." The reference was made, not so much for its factual value, as for its historical interest.

The requirement, as the Study progressed, of three independent measurements was made partly because of evidence that experienced examiners did measure at times "too high or too low."

The authors do not "regard statistical procedures as essentially applicable to cross-sectional data." For examples of their application to longitudinal data, see pp. 78, 110, 112, 146-149, 170, 201-202, 213-230, 232, 245, 288, and 300 of the text.

Finally, in the summary of the book a score or more of findings are listed which have been neither confirmed nor refuted by the reviewer. They are not discussed. If the reader wants to know what they are, he will either have to consult the book or find a more informative and constructive review. The fact that the substance of the book has escaped unscathed at the hands of so critical a reviewer is comforting to the authors and may be reassuring to the reader.

III

A NOTE ON PROFESSOR DEARBORN'S REPLY

BY HOWARD V. MEREDITH

University of Iowa

In reviewing publications in child development, it is my working assumption that critical statements should be confined to those areas in which the reviewer is best qualified to undertake rigorous examination and appraisal. My review of *Predicting the child's development* is focused upon the problem of reasonable clarity and accuracy in the reporting and interpretation of research on physical growth. It is intended to afford readers of the *Psychological Bulletin* one worker's careful and well-considered reactions. Interested readers will want to set aside certain of Professor Dearborn's phrases (e.g. "mildly misrepresentative," "picayune," "garbled quotation," "misrepresents the content," reviewer's "appetite must have been whetted beyond reason") and proceed to an examination of the materials and issues at their source.

PSYCHOLOGY AND THE WAR

STEUART HENDERSON BRITT, *Editor*

EMPLOYMENT OF PSYCHOLOGISTS IN THE FEDERAL GOVERNMENT

The Federal government is the largest single employer of psychologists. This should be an important item of news to those psychologists over the country who may feel that psychologists are not being adequately utilized in the war effort. Not only are large numbers of psychologists engaged in psychological activities in connection with the military program, but most of the others working for the Federal government are concerned with problems very closely related to the war program.

More than 400 psychologists are today employed in various branches of the Federal service. As to the exact number, this depends on our definition of who is a psychologist. Included in this estimate of over 400 are individuals who are well trained and experienced in psychology and who are engaged essentially in psychological work (such names as Bingham, Brotemarkle, Carmichael, Jenkins, Likert, Louttit, Richardson, Shartle, and many others come to mind); those who are trained in psychology, but who are not engaged in purely psychological work; and those with only a small amount of graduate work in psychology, but who are carrying on psychological activities in their jobs.

Although large numbers of the psychologists employed in the Federal service are stationed in Washington, D. C., many others are located in other sections of the country. Of course, it should also be noted that a great many other individuals around the country who are not actually holding Federal positions are working on psychological research projects and carrying on other important endeavors in relation to national defense. The current survey indicates that psychologists are employed in those divisions of the Federal government listed below, although it may be that there are additional agencies which should be added to the list:

War Department

Air Forces:

Office of the Air Surgeon

General Staff

Office of the Adjutant General:

Field

Personnel Procedures Section

Office of the Chief Signal Officer

Navy Department

Bureau of Aeronautics
Bureau of Medicine and Surgery
Bureau of Navigation

Department of Commerce

Bureau of the Census:
Division of Statistical Research
Civil Aeronautics Administration
National Bureau of Standards

Department of Agriculture

Bureau of Agricultural Economics
Bureau of Home Economics
Farm Credit Administration
Forest Service
Office of Personnel
Surplus Marketing Administration

Department of Justice

Bureau of Prisons

Department of Labor

Bureau of Labor Statistics
Children's Bureau

United States Civil Service Commission

Council of Personnel Administration
Director of Research
Examining Division

Federal Works Agency

Public Works Administration
United States Housing Authority
Works Progress Administration

Federal Security Agency

Civilian Conservation Corps
Howard University
National Youth Administration
Office of Education
St. Elizabeths Hospital
Social Security Board:
Bureau of Employment Security
Bureau of Research and Statistics
State Technical Advisory Service
United States Public Health Service:
Division of Industrial Hygiene
National Institute of Health

Federal Communications Commission

Foreign Broadcast Monitoring Service

Coordinator of Information
Office of Facts and Figures
Office of Coordinator of Inter-American Affairs
Tennessee Valley Authority
Library of Congress
National Advisory Committee for Aeronautics
National Roster of Scientific and Specialized Personnel

The best procedure for any psychologist interested in government service is to write to the Information and Recruiting Section of the United States Civil Service Commission and ask to have his name put on a list to receive notices of examinations in such fields as psychology, personnel work, and statistics. Information concerning examinations in all fields covered by the Civil Service Commission can also be obtained at any first- or second-class post office. Also, any psychologist who has not already registered with the National Roster of Scientific and Specialized Personnel, 916 "G" Street N.W., Washington, D. C., should write to the National Roster and ask to receive a check list in the field of psychology. Although the National Roster of Scientific and Specialized Personnel is not an employment agency, it does receive requests from other governmental agencies to supply names of individuals with various types of technical training, and thus the names of psychologists and other specialists may from time to time be presented to such agencies for consideration. However, the place to write with reference to individual problems of psychologists is not the National Roster of Scientific and Specialized Personnel, but rather the Office of Psychological Personnel, National Research Council, 2101 Constitution Avenue, Washington, D. C., which is discussed below.

THE OFFICE OF PSYCHOLOGICAL PERSONNEL,
AND
THE NATIONAL ROSTER OF SCIENTIFIC AND
SPECIALIZED PERSONNEL

Letters received from many psychologists throughout the country indicate the desirability at this time of a published statement regarding the functions of the Office of Psychological Personnel, National Research Council, and the National Roster of Scientific and Specialized Personnel. These are two separate organizations in Washington, D. C., situated in different parts of the city and

concerned with different problems. The two offices are located as follows:

- (1) Office of Psychological Personnel
National Research Council
2101 Constitution Avenue
Washington, D. C.
- (2) National Roster of Scientific and Specialized Personnel
916 "G" Street N.W.
Washington, D. C.

(1) The Office of Psychological Personnel, located in the building of the National Research Council, is an office newly created by the American Psychological Association in order to assist psychologists throughout the country on various personnel problems, such as information concerning the utilization of psychologists in the Federal government, the Army, the Navy, and in various research projects. It is not a governmental agency, but exists in order to serve as a "clearing house" of information for psychologists, and to perform other duties in Washington, D. C., for psychologists living in other sections of the country.

Just as soon as a man fills out and returns the questionnaires sent to him by the Office of Psychological Personnel (formerly called the Subcommittee on the Listing of Personnel in Psychology), information is immediately sent to the War Department concerning him. This means that rather complete information is then on file in the War Department about him even prior to his possible induction. Thus, if any inquiry arises within any branch of the War Department for the names of individual psychologists, the information is readily accessible. Also, prior to the induction of any psychologist, information about him can be sent from the appropriate division of the War Department to his Reception Center, indicating his specialized training and his probable date of induction. This is in no sense a guarantee that any individual psychologist necessarily will be utilized in psychological work, although it does mean that, if there is a need for men with his particular type of training, he might be used in classification or testing work.

(2) On the other hand, the National Roster of Scientific and Specialized Personnel is a governmental agency jointly administered by the National Resources Planning Board and the United States Civil Service Commission, and its primary function is the conservation and most effective utilization of scientifically and technically trained personnel in all fields in connection with the

national defense program. Over 50 different fields of specialization are represented in the National Roster of Scientific and Specialized Personnel, and psychology alone accounts for the registration of over 3,200 individuals. The National Roster from time to time fills personnel needs of other governmental agencies by supplying names and other information concerning specialists in various fields, but it is not an office dealing with individual problems of psychologists. Instead, matters of this sort should be taken up with the Office of Psychological Personnel at the National Research Council.

At present the National Roster of Scientific and Specialized Personnel is engaged in the collection of special information about persons registered with it whose age would make them subject to call for training and service under the provisions of the Selective Training and Service Act of 1940. Although the Roster has no direct authority with reference to classification or induction procedures under the Selective Service System, it is charged with the obligation of assisting the nation in using its trained personnel in the most effective way possible. Accordingly, under a cooperative plan the Roster, *in certain cases only*, will transmit to the Office of the National Headquarters of the Selective Service System in Washington, D. C., appropriate information about technically trained persons of military age, and that office in turn may send letters about these men to their Local Boards to assist in their proper classification. Of course, it should be understood that the matter of classification is within the jurisdiction of the Selective Service Local Boards.

Also, whenever a man registered with the National Roster is likely to be inducted into the Army, information is sent to the appropriate division of the War Department, giving his educational training, occupational experience, and other pertinent data. Obviously, no guarantee can be given in advance that this procedure will result in any special privilege, since there are occupational shortage problems in the Army as well as personality factors that must be taken into account. But the information sent to the War Department thus far about various men has been of very practical use in the procedure of assigning such technically trained individuals to their duties.

In other words, any man who is now engaged in, or has completed, any graduate work in psychology, and who is subject to call under Selective Service, should write at once, if he has not already done so, to *both* the Office of Psychological Personnel,

National Research Council, and to the National Roster of Scientific and Specialized Personnel, and ask to receive appropriate questionnaires in psychology. In both instances he should be sure to mention that he has had graduate training in psychology and that he is of military age. (If he has done no graduate work in psychology, but has simply majored in psychology in college, he should write *only* to the Office of Psychological Personnel, National Research Council.) He should also inform both offices *immediately* if his classification under Selective Service changes or if he is nearing induction, in order that detailed information about him can be sent to the War Department.

It should be clearly understood that neither the National Roster of Scientific and Specialized Personnel nor the Office of Psychological Personnel, National Research Council, can secure commissions in any branch of the service for anyone. A few psychologists with special qualifications have been commissioned in the Office of the Air Surgeon, Headquarters of the Army Air Forces, and have been assigned to duties in Psychological Research Sections, but any further policy with reference to the commissioning of men of military age cannot be stated. It should also be emphasized that no definite promises can be made by the two offices discussed above or by the War Department that any given individual will necessarily be used in psychological work, although the chances are very great that men with psychological training will be utilized either in classification, personnel, or testing work. In some instances this may lead to officer's training, but in other cases not. In those instances in which a psychologist is commissioned, he probably will serve as a Personnel Consultant; the psychologist who is not commissioned probably will assist in classification work or in some special testing program. Therefore, any man who enlists or is inducted should be sure to tell his interviewing officer at his Reception Center the details of his specialized training and experience.

There are two kinds of activities in particular which psychologists inducted into the Army are carrying on at the present time. One is the testing of aviation cadets, performed by psychologists attached to Office of the Air Surgeon, Headquarters of the Army Air Forces; the other is personnel and classification work in various arms and services. The former program was described in the March issue of the *Psychological Bulletin*; additional information concerning personnel work in the Army will be given in the May issue.

BOOK REVIEWS

HOLZINGER, K. J., & HARMAN, H. H. *Factor analysis: a synthesis of factorial methods*. Chicago: Univ. Chicago Press, 1941. Pp. xii + 417.

For a book on factor analysis the present volume is remarkably free from emotional bias or pet theories. This is in part due to the fact that the authors consider factor analysis as a statistical method generally applicable to all problems where a large number of quantitative variables are involved, rather than merely to the restricted fields of psychology and education which have been primarily responsible for the development of the factor methods. All of the leading factor techniques are given competent treatment with no attempts to disparage or champion any individual method. Very little of the controversial exposition which has characterized several of the preceding volumes on factor analysis by other writers is to be found in this volume.

The book is divided into four parts:

Part I, "Analytical and Geometric Bases for Factor Analysis," consists of five chapters: "Introduction"; "Basic Statistics"; "Geometric Formulation of the Factor Problem"; "Determination of the Common Factor Space"; and "Preferred Types of Orthogonal Solutions." In the first four of these chapters is developed the basic mathematical foundation for factor analysis common to all generally accepted methods. Chapter 5 introduces the various types of current factor methods.

Part II, "Direct Orthogonal Solutions," includes three chapters entitled, respectively, "The Bi-Factor Solution and Sampling Formulas"; "The Principal Factor Solution"; and "The Centroid Solution." For each method the basic formulas are developed in some detail, and many diagrams and numerical illustrations are provided.

Part III, "Derived Solutions—Orthogonal and Oblique," includes the following chapters: "Derived Principal Factor Solution"; "Orthogonal Transformations in the Multiple Factor Solution"; and "Oblique Solution." Diagrams and numerical examples are extensively used to clarify the mathematical exposition in these three chapters.

Part IV, "Estimation of Factors and Relationships Between Factors," includes two chapters: "The Estimation of Factors" and "Relationship Between Different Factor Solutions." The first of these is concerned with the problem of estimating factor loadings on each of the factors for each case in the sample, and a number of alternative methods are presented. The second chapter is concerned simply with methods for transforming one factor matrix into another. Here again extensive numerical examples are provided.

A lengthy appendix following the text includes, among other things, an outline of the fundamentals of matrix theory, outlines for computation of the various factor methods, and work-sheet procedures for the solution of simultaneous linear equations. A bibliography of more than 130 references is included in the volume.

It would, of course, be possible to suggest various other alternative procedures for carrying out the computations in connection with the methods of factor analysis described, but it is not to be expected that all

practical or useful variations could be included in a volume even so complete as this one. One omission, however, was a little surprising to the reviewer. The authors, in discussing the transformation of a given pattern to a principal factor solution, indicate the formal solution based on a characteristic equation. Numerical illustrations are given in considerable detail. The authors fail, however, to point out that the characteristic equation in this connection is entirely analogous to the one obtained in the direct principal axis solution and that the same iterative procedure which they suggest for the direct solution is applicable when transforming a given pattern to a principal factor solution. As a matter of fact, the formal solution is almost prohibitive if the number of factors is more than five or six.

Some contributors to the development of factor analysis methods will recognize solutions and procedures which the authors have not explicitly attributed to them, but in so rapidly expanding a field, it is not to be expected that such an ambitious synthesis as the authors have attempted can hope to allocate credit to the satisfaction of all.

Investigators who have struggled with an extensive variety of factor configurations will recognize the limitations of the technique of beta-coefficients in certain special cases and may well wish for a discussion of other possible alternative methods for the preliminary grouping of variables.

However, the authors have turned out a thoroughly professional job. Whatever may be said of the individual merits of previous volumes on factor analysis, the present volume is undoubtedly the most useful contribution as a general textbook and reference work which has yet appeared on the subject of factor analysis.

PAUL HORST.

*The Procter & Gamble Company,
Cincinnati, Ohio.*

RUCH, F. L. *Psychology and life: a study of the thinking, feeling, and doing of people.* (New ed.) Chicago: Scott, Foresman, 1941. Pp. xii + 754.

The new edition of *Psychology and life* differs from the first edition in several major respects. Considered generally, these changes are almost all in the direction of the traditional treatment of the subject matter of general psychology.

The most obvious change is the incorporation of two new chapters at the end of the book in a section called "Physiological Backgrounds." The two chapters of this section are entitled "The Form and Functioning of the Nervous System" (19 pages), and "Division of Labor in the Brain" (29 pages). This brief survey of the physiological and neurological correlates of behavior is clear and accurate and does not depend excessively upon analogies to clarify its meaning, though the perennial telephone switchboard makes its appearance and will doubtless appear incorrectly answered as an item in hundreds of true-false examinations. The criticism that may be appropriate to this section concerns the lack of integration with the preceding chapters. There is no doubt that the addition of

these chapters will make the book more popular, but it might be wished that along with the other changes in the book the subject matter of these last chapters had been made more relevant to the rest of the book. The author's aim of a "full-blown General Psychology" might better have been attempted by such a plan or by frankly setting it off as a mere appendix. The several pages on the "neurological basis of learning" cannot possibly give the critical student the assurance that the hypotheses are either bases for, or even clearly related to, the kind of learning and learning situations cited in previous chapters.

In one sense this criticism is only partly justified, for considerable revision has been made in the other sections of the book. Dr. Ruch seems to have successfully ignored the low interest value of students for such topics as mazes, animal learning, and the like, which was a guiding principle in the first edition. The book now contains numerous examples of animal experimentation and of experiments which are perhaps not of immediate major interest to students, but which have findings of significance for psychology. For example, in the first edition there was only one indexed reference to maze learning, whereas in the second edition four such references occur.

The new edition is a more objective and comprehensive textbook, and to the reviewer it is apparent that Dr. Ruch's happy faculty of getting the most out of his words is still retained. Sometimes a few words carry paragraphs of meaning, as, for example, the legend under an illustration of a fluctuating figure: "Much depends on how you look at things in life. Perception can shift—and shift—and perhaps lead to new solutions" (p. 269). The new edition is 75 pages longer than the old edition but has the same number of chapters (18). This has entailed some consolidation, and in addition there has been a change in the sequential order of presentation of topics. In the first edition personality, intelligence, applied psychology, etc. precede sections on the senses, perception, and learning, whereas in the revised edition the more logical and traditional sequence is used. This trend to conservatism is also noted in the appearance of the book. The full-page, marginless illustrations are missing in favor of the usual type of illustrations, and the chapter headings and subtitles are less attention-getting and more explanatory. One has the feeling that, given another revision, the section on physiological backgrounds would migrate to the front of the book and the metamorphosis into the traditional general psychology would complete itself. The revised edition is in many respects a better textbook, and some instructors who were antagonized by the excessive catering to student interest in the first edition, or who desire a somewhat more factual and conservative textbook, will do well to examine this new edition.

JACK BUEL.

Wesleyan University.

BRENNAN, R. E. Thomistic psychology: a philosophic analysis of the nature of man. New York: Macmillan, 1941. Pp. xxvi + 401.

Dr. Brennan, an adherent of Thomistic philosophy, has written an excellent, straightforward account of the psychological system of Thomas

Aquinas. It is, of course, primarily a "philosophical" psychology. As one reads, it appears that the underlying motif of the book is to exhibit Thomism as fundamentally Aristotelianism. So undeviatingly is this point of view followed that the eleven chapters describing Aquinas' psychology proper take up *seriatim*, for more expanded discussion, the ordered topics of the author's concise exposition of Aristotle's own psychology, to which the brief opening chapter is separately devoted. But this is Aristotle as seen through Aquinas' glasses:

... the perspective is derived ... *from the perspective which Aquinas himself reveals in his commentaries on these texts* (author's italics).

Further:

Perhaps the meaning ... is not always the import that Aristotle himself had in mind. This is really beside the point since ... the criterion ... is not the authority of the Stagirite, but the truth of the matter. ... The psychology of the Stagirite is perennial precisely for the reason that it is true; and the psychology of Aquinas is likewise enduring because, having fixed upon the truth of Aristotle's insights into human nature, it has preserved and ordered and systematically expanded upon these insights.

The perennial truth of the resultant Thomistic doctrine makes it an adequate frame within which any worthy findings of past, present, or future psychology take their ordered places. This adequacy is specifically emphasized in the final chapter of the book, "Modern Psychology and the Thomistic Synthesis," in which the author shows knowledge of latter day theoretical tendencies, with a partly sympathetic and a partly askance attitude toward their importance or their logic. The following quotations, for brevity's sake taken out of the fuller and supporting context, serve to symbolize the essence of the author's attitude.

... I believe it can be shown that the philosophic outlook of the Angelic Doctor has a real bearing on the problems investigated by the experimenter and the clinician. This bearing or relationship is established at two points in the programs of scientific psychology: first, at the beginning, where the philosophic approach furnishes certain directive principles as to how investigative work shall be prosecuted; second, at the end, where the same outlook supplies further criteria as to how the results of investigation shall be interpreted.

To illustrate: it should be clear to the scientist *preinvestigatively* that man is an essential composition of soul and body. ... Similarly, it should be obvious to the scientist *postinvestigatively* that human thinking and human willing are irreducible to purely sensitive acts.

A few pages farther on:

Finally, let us urge once more the point that not every philosophy is useful to the science of psychology, but only that analysis which expounds the truth of human nature. Such, I take it, is the analysis which was formulated over two thousand years ago by Aristotle, which was subsequently taken over, refined, and developed by Aquinas, and which presently is known as the traditional psychology.

As to the author's exposition as a whole, the reviewer feels, on the negative side, that it fails to bring out any essential contributions of Aquinas as distinguished from those of Aristotle. He gets from the text little impression of advance—after nearly sixteen centuries. Aquinas' own philosophical greatness is not evident to him. Aquinas appears chiefly as a devoted and significant editor and commentator—illustrating, expanding, illuminating, systematizing the master's thought—but not as an original thinker in his own right. Any student of the history of psychology would naturally look for explicit emphasis on Aquinas' differential contributions.

The author chose, rather, to present objectively the developed Thomistic doctrine. That he has done—clearly, systematically, in simple, readable, and untechnical language. Any who are interested in that significant phase of the historical development of psychological thinking could scarcely do better than to read Dr. Brennan's book.

ROSWELL P. ANGIER.

*Los Ranchos Perkins,
Tucson, Arizona.*

BOOKS AND MATERIALS RECEIVED

FREEMAN, W., & WATTS, J. W. Psychosurgery: intelligence, emotion and social behavior following prefrontal lobotomy for mental disorders. (With special psychometric and personality profile studies by T. Hunt.) Springfield, Ill.: Thomas, 1942. Pp. xii+337.

GLASER, E. M. An experiment in the development of critical thinking. *Teach. Coll. Contr. Educ.*, No. 843. New York: Bureau of Publications, Teachers College, Columbia Univ., 1941. Pp. ix+212.

GRAEBER, I., BRITT, S. H., *et al.* Jews in a gentile world: the problem of anti-Semitism. New York: Macmillan, 1942. Pp. x+436.

KINHART, H. A. The effect of supervision on high school English. *Johns Hopk. Univ. Stud. Educ.*, No. 30. Baltimore: Johns Hopkins Press, 1941. Pp. ix+102.

MCNEMAR, Q., & MERRILL, M. A. (Eds.) Studies in personality, contributed in honor of Lewis M. Terman. New York: McGraw-Hill, 1942. Pp. x+333.

SORENSEN, H., & LEMON, A. C. Workbook for psychology in education. New York: McGraw-Hill, 1942. Pp. viii+178.

STOGDILL, R. M. Manual of directions for the behavior cards: a test-interview for delinquent children. Columbus: Hedrick (Psychological Corporation, Distr.), 1941. Pp. 18.

NOTES AND NEWS

DR. KURT KOFFKA, William Allen Neilson professor of experimental psychology at Smith College, formerly professor of psychology at the University of Giessen, died on November 23, 1941, at the age of 55.

DR. HARRY CAPPS, assistant professor of psychology at Louisiana State University, died on January 17.

DR. WAYNE DENNIS has been appointed professor of psychology and chairman of the department of psychology at Louisiana State University, Baton Rouge, Louisiana. The appointment became effective January 27.

DR. JOHN E. ANDERSON, director of the child welfare institute, University of Minnesota, has been appointed chairman of the Minnesota committee of the White House Conference on Children in a Democracy.—*Science*.

THE MIDWESTERN PSYCHOLOGICAL ASSOCIATION will hold its seventeenth annual meeting at Hotel Statler, St. Louis, Missouri, on Friday and Saturday, May 1 and 2, 1942, under the presidency of Dr. J. P. Porter. The title of his presidential address will be "Psychology and the Functional Integration of Human Behavior." The members of the department of psychology at WASHINGTON UNIVERSITY will act as hosts, with Dr. J. P. Nafe as Chairman of the local committee. On account of the considerable distance of the University from housing facilities, all meetings will be held at the Association headquarters, Hotel Statler, where special arrangements are being made.

THE NATIONAL INSTITUTE OF PSYCHOLOGY, at a meeting at Northwestern University, Evanston, Illinois, on September 4, elected the following officers: President—Dr. John A. McGeoch, the State University of Iowa; Vice-President—Dr. Ernest R. Hilgard, Stanford University; Secretary-Treasurer—Dr. G. R. Wendt, Wesleyan University; Directors—Dr. Walter R. Miles, Yale University, and Dr. L. L. Thurstone, University of Chicago.

A CONFERENCE OF PSYCHOLOGISTS ON THE DEVELOPMENT OF MORALE IN CHILDHOOD AND YOUTH was held at CLARK UNIVERSITY on November 28. The speakers included: Dr. Gordon Allport, Harvard University; Dr. Carroll Pratt, Rutgers University; Dr. Gregory Bateson, formerly of Cambridge University, England; Dr. Ronald Lippitt, Boy Scouts of America; and Dr. Karl Buehler, Dr. Charlotte Buehler, and Dr. Saul Rosenzweig, Clark University.

The final session of the Conference was devoted to a Round Table, led by President Leonard Carmichael, of Tufts College. About 200 attended.

The Chairman of the Conference was Dr. Vernon Jones, of Clark University.

A shortage of military psychologists in GERMANY has previously become known (*Psychol. Bull.*, 1941, 38, 779). We are learning now of the

introduction of a new academic degree, DIPLOMA PSYCHOLOGIST, which appears as a means to cope with this shortage. The new degree ranks lower than the Ph.D., which up to this time has been the only academic degree conferred in psychology, as in most academic fields in Germany. The new title has a precedent in the old established title of Diploma Engineer.

The information is from *Psicotecnica*, 1941, 2, 218, where we find under the heading "The title of 'Diploma Psychologist' in Germany" the following item:

Need of the state, the army, and business with regard to psychology have demanded in Germany a broader basis for the training of professional psychologists. By decree of the Reich Minister of Education a regulation for the degree of Diploma Psychologist was put in effect beginning with April 1, 1941. The study of psychology may be pursued at all universities and institutes of technology where the specialty of psychology is represented by a chair of psychology and other chairs of related fields. The study of psychology takes a minimum of 6 semesters and terminates with the conferring of the academic title of *Diplom-Psychologe* (abbreviated *Dipl.-Psych.*). The examination for the diploma covers the following fields: diagnostic psychology, applied psychology, educational psychology, cultural psychology, psychology of other countries, and medico-biological auxiliary sciences as well as philosophy and world view (*Weltanschauung*).

A COMMEMORATIVE VOLUME prepared by a group of former graduates of the Stanford University psychology department was presented to PROFESSOR LEWIS MADISON TERMAN, chairman of that department since 1922, at a recent dinner given by Judge and Mrs. William F. James in honor of his birthday.

The volume, *Studies in personality, contributed in honor of Lewis M. Terman*, contains 16 original research papers prepared by psychologists who in the past have worked under Dr. Terman's direction at Stanford. All in the general field of personality, the papers range from studies of personality development and measurement to studies of psychical belief and abnormal phenomena. The volume includes an introduction by Robert S. Woodworth, emeritus professor of psychology at Columbia University, and a bibliography of Professor Terman's writings.

Editors of the volume were Dr. Maud Merrill James and Dr. Quinn McNemar, members of the Stanford psychology faculty.

THERE remain in the reserves of the Stanford University Library 11 copies of the MONOGRAPH of the late PROFESSOR JOHN E. COOVER on "Formal discipline from the standpoint of experimental psychology" (*Psychol. Monogr.*, 1916, 20, No. 3, pp. 307). Anyone wishing a copy of this monograph for his college or university may obtain it gratis by having the librarian of his college or university request it from The Librarian, Stanford University, California. First come, first served.

At a meeting of the Western members of the BIOMETRIC SECTION OF THE AMERICAN STATISTICAL ASSOCIATION held on the Berkeley campus of the University of California from December 29 to 31, 1941, a resolution to establish a permanent organization to be known as the WESTERN SO-

CIETY OF BIOMETRICIANS was passed. An Organizing Committee, including representatives from all directions of research that would be interested in the new Society, was elected. A proposal, originating earlier with the Biometric Section of the American Statistical Association, to establish a new journal for the publication of biological papers using mathematics in amounts too burdensome for purely biological journals was also warmly endorsed.

The officers and members of the elected Organizing Committee are as follows: Chairman—Dr. J. Neyman (Mathematical Statistics), University of California, Berkeley; Vice-Chairmen—Dr. E. B. Babcock (Genetics), Dr. R. T. Birge (Physics), Dr. E. C. Tolman (Psychology), all from the University of California, Berkeley; Secretaries—Dr. E. Dempster (Genetical Effects of Irradiation), University of California, Berkeley; Mr. G. Hormay (Range Management), California Forest and Range Experiment Station, Berkeley; Members—Dr. H. Borsook (Biochemistry), California Institute of Technology, Pasadena; Dr. F. N. Briggs (Plant Breeding), University of California, Davis; Professor A. G. Clark (Mathematical Statistics), Colorado State College, Fort Collins; Dr. S. Emerson (Genetics and Population Studies), California Institute of Technology, Pasadena; Dr. H. O. Halvorson (Bacteriology), University of Minnesota, Minneapolis; Mr. A. A. Hasel (Silviculture), California Forest and Range Experiment Station, Berkeley; Dr. P. C. Hoel (Mathematical Statistics), University of California, Los Angeles; Dr. J. A. Jenkins (Cytogenetics), University of California, Berkeley; Dr. G. F. MacLeod (Entomology), University of California, Berkeley; Dr. A. G. Marshak (Biophysics), University of California, Berkeley; Dr. J. R. Oppenheimer (Theoretical Physics), University of California, Berkeley.

All persons interested in the new society are invited to communicate with one or another member of the Organizing Committee.

THE NEUROLOGY OF SPEECH AND READING, a course dealing with causes and treatment of language problems, will be given by Dr. Edwin M. Cole and his associates at the Massachusetts General Hospital, Boston, during the month of July, 1942. The course consists of 20 morning lectures and clinic demonstrations by physicians and educators, covering problems in speech and reading as seen by teachers in their daily work at school and by physicians in their practice. For further particulars, write to Miss Miriam Phelps, Language Clinic, Box 396, Massachusetts General Hospital, Boston, Massachusetts.

"Making the Findings of Research Useful" was considered by WILLARD OLSON, of the University of Michigan, in addressing the NATIONAL ASSOCIATION FOR NURSERY EDUCATION at its recent Detroit conference.

In pointing out that the application of research was a research process and therefore subject to its rules, Dr. Olson outlined three criteria in applying research: (1) The problem should be defined by people applying the findings; (2) solution of the problem should involve participation of the practitioner; (3) applied research should use something more than common sense—that is, should actually involve the collection of data and making of proper generalizations.

In summarizing conference trends, ALICE KELIHER, assistant professor of education at New York University, pointed out that actual real advances had been made in understanding human conduct, particularly in the realm of emotions.

CREATION OF THE OFFICE OF PSYCHOLOGICAL PERSONNEL

Psychologists will be interested in the following resolution adopted unanimously by the Council of the American Psychological Association in February, 1942:

WHEREAS the Nation finds itself in a grave emergency requiring the efficient utilization of available man power; WHEREAS psychologists in increasing numbers are bringing their special training to bear on the conduct of the war; WHEREAS the several services and various institutions are facing serious shortages or dislocations; WHEREAS Associates and Members of the American Psychological Association have indicated unequivocally by a poll and actions at the Annual Meeting their desire for extended services in their behalf; and WHEREAS a formal request for such extension has been received from the Emergency Committee in Psychology of the National Research Council;

BE IT RESOLVED: (1) that the Association take steps immediately to establish an Office of Psychological Personnel to be concerned with the maximum, effective use of psychologists, irrespective of society membership, in the war effort; (2) that the Council exercise its powers to extend the functions of the Secretary's office by the appointment of an Assistant Secretary to be known also as the Executive Director of the Office of Psychological Personnel; (3) that Council appropriate at once the sum of four thousand dollars (\$4000) for the part-time salary of the Executive Director, secretarial assistance, and operating expenses for the period of February 1, 1942, to October 1, 1942; (4) that the continuation of the office, its relation to the Secretary's office, and its continued support be reviewed at the next Annual Meeting of the Association; (5) that the Chairman of the Division of Anthropology and Psychology be requested to make the necessary arrangements, if possible, for the location of the office in the headquarters of the National Research Council in Washington or to make other suitable arrangements that will obviate the payment of rent; (6) that foundation assistance in the support of the office be welcomed if obtainable; and (7) that the Treasurer be authorized to draw drafts on any available funds of the Association for the purposes specified above.

Signed,

Council of Directors

ELMER A. CULLER

HORACE B. ENGLISH

JOY B. GUILFORD

EDWIN R. GUTHRIE

EDNA HEIDBREDER

ERNEST R. HILGARD

CALVIN P. STONE, *President*

WILLARD L. VALENTINE, *Treasurer*

WILLARD C. OLSON, *Secretary*

Plans for the office were presented by the Emergency Committee in Psychology through its Chairman, Karl M. Dallenbach. Leonard Carmichael, Chairman of the Division of Anthropology and Psychology of the National Research Council, has completed arrangements for the necessary office space. Dr. Steuart Henderson Britt has been appointed Executive Director and should be addressed at the National Research Council, 2101 Constitution Avenue, Washington, D. C.



Psychological Bulletin

THE EXPERIMENTAL STUDY OF AESTHETIC JUDGMENTS

BY HENRY N. PETERS

University of Missouri

INTRODUCTION

The field of aesthetics has traditionally been divided into two distinct parts, creation and appreciation. This review is concerned only with the second of these parts. Of human behavior in general it is concerned with a very everyday type of reaction, namely: acts of choice, expressions of preference, and statements of appreciation. The common element running through all members of this class is that at the time they occur they are acts of either acceptance or rejection, or they symbolize such acts. Yet, since actual experimental investigation of this phase of human behavior has been directed at the phenomena of judgments, or at symbolic movements representing the overt choices, the field should be defined operationally in terms of evaluating judgments. It is assumed that these judgments indicate awareness on the part of the subject of an affective state. These inferred affective states, which are the real objects of interest in the study of aesthetic appreciation, shall be referred to in this paper by such terms as aesthetic experience, pleasantness and unpleasantness, affection, feeling, and their cognates.

The judgmental methods employed in experiments on aesthetics consist of the three basic ones, rank order, paired comparison, absolute judgment, and numerous modifications of each. The three basic methods are described in requisite detail by Woodworth (96), Guilford (38), and Beebe-Center (5). Since the data of aesthetics consist of judgments, the method employed in eliciting the judgments must be considered one of the primary conditions of the results of an experiment. Consequently, any principles of difference between the various methods, demonstrated either in psychophysics or in aesthetics, are pertinent to the present sub-

ject. Any laws found to govern judgmental reactions must be taken into account in interpreting the results of aesthetics experiments. Special attention should be given the relative nature of absolute judgments (cf. Harris, 39, 40; Hunt, 47) and the significance of "mixed" judgments, recently demonstrated by Lanier (53).

The Experimenter's Stimulus Error

The stimulus error, as originally defined by Titchener, is an error of the observing subject. It consists in his assumption of an undesirable set, or *Einstellung*, the most frequent form being that of common sense which points the subject's attention toward, and words his reports in terms of, physical objects; whereas the set desirable for introspection restricts his attention and reports to existential, conscious qualities. In determining the two-point threshold, for example, the subject makes the stimulus error when he tries to identify the stimulus correctly as one or two points instead of reporting merely the presence of "oneness" or "twoness" (9). When the data of an experiment consist of judgmental reports, choice and rigid control of subjects' observational set are just as important today as they ever were.

There is, however, another form of this same fundamental stimulus error which is perhaps even more important for present-day, functional experimentation. This error differs from the other in that it is distinctly the experimenter's, rather than the subject's, confusion of the two definitions of "stimulus." It consists in explicitly or implicitly treating a stimulus variable which has no meaning apart from human reactions as if it had independent, physical existence. This is especially vicious and confusing in the field of aesthetics, where stimulus relationships and qualities, such as unity, complexity, simplicity, balance, symmetry, fusion, smoothness, formality, and representativeness, are studied in relation to value. Definition of qualities such as these is frequently given in terms of the physical object or its elements, or in a manner implying that anyone who took the trouble to look for them would remark their presence and amount. Complexity, for example, has been very conveniently defined for polygons in terms of the number of sides the figure contains. Other qualities, such as familiarity and even pleasantness itself, which are more obviously human reactions and logically difficult to conceive of as being "in the physical object," are sometimes implicitly located in the physical stimulus. This is the case, for example, when familiarity is

measured in terms of frequency of appearance, and when pleasantness or unpleasantness of a stimulus is assumed to be present to a subject whenever the stimulus is present.

Stimulus qualities such as those listed in the last paragraph have no meaning except in terms of human reactions. They really *are* human reactions to the physical stimulus; and there is nothing within the physical stimulus itself which indicates the degree of the quality it will arouse in any one subject or in the average subject. If definition is attempted in terms of number of elements, grams, wave length, or foot-candles, it should be clearly realized that such definition is entirely arbitrary unless correlation with a behavior indicator has been established. The most obvious measure of stimulus qualities is in terms of judgmental reports. It is possible, however, to employ other indicators, such as reaction time, P. G. R., muscle tension, or ease of learning.

Examples of this form of the stimulus error are cited in the following pages as cases of confusion of the *physical stimulus* and the *psychological stimulus*. In some instances the error takes the form of explicitly defining the stimulus quality in terms of physical concepts (cf. page 292); in others, the error consists in failure to define the quality in terms of the psychological stimulus, thus implying that it is identifiable in terms of the physical stimulus (cf. page 285).

The body of this review is divided into three parts corresponding to three aspects of aesthetic experience. Part I, on "Attitudes," is concerned with the response aspect of pleasantness and unpleasantness. This section treats experiments which bear especially on the nature of the affective state. Part II, on "Perception," deals with the stimulus aspect of aesthetic experience. Part III, entitled "Experience," includes a discussion of experimental results which bear on the genetic aspect of affection.

The chief concern of the present paper is with the fundamental nature of aesthetic experience. A voluminous section of the literature on group differences in mean judgment values, which has little direct bearing on the nature of the responses underlying the judgments, has been purposely ignored.

I. ATTITUDES

A tendency to stress the relevance of attitudes to aesthetic judgments occurred early in the history of the psychology of aesthetics and has persisted to the present. They are usually re-

ferred to in two distinguishable ways—namely, as interference factors which cut across the truly affective and thus introduce excessive variability into the data, and as somehow germane to the nature of affection itself. Yet no systematic attempt has been made to specify and clarify just what the fundamental psychological nature of attitude in relation to aesthetic judgment is.

The Nature of the Concept "Attitude"

Attitude is a member of that rather crowded class of concepts invoked in some form by every systematist to explain the apparent directedness of behavior, the puzzling problem of why any particular response is what it is rather than one of numerous other possibilities. In a recent exposition of the systematic importance of these selective agents by Kingsbury and Carr (50), they are all grouped together under the appropriate caption of "directional dispositions." Wants, interests, needs, motives, Allport's traits, Lewin's valences, McDougall's instincts, Freud's complexes, Wheeler's field forces, all belong in this class with attitude. Perhaps the most crucial thing to hold in mind about these concepts, for the sake of clear thinking, is the fact that they *are* concepts and not phenomena, data, or observables. They are inferred from the persistent appearance in a subject of observed reactions. Directional dispositions are labeled with the names of psychological objects which stimulate the persistent reactions; and furthermore, each is endowed with a conceptual energy which varies in strength with the persistence of the reactions and which is positively or negatively directed with respect to the object. These antipodal directions are conceptualizations of the observed increase or decrease in distance between subject and stimulus which is effected by a large category of human reactions. Now, since the approach to some psychological objects entails prolonged activity in which transient responses of approach and avoidance to immediately presented stimuli are made, and since with repetition of the prolonged activity the transient responses become persistent, though intermittent, it is obvious that all directional dispositions cannot be conceived of as on the same level and of the same duration. This problem can be solved if it be conceived that with the first approach to (or avoidance of) an object requiring prolonged activity the directional disposition selects the transient responses themselves; but with repetition a lower-level disposition becomes established toward each stimulus eliciting a transient response, and the primary, prolonged disposition comes to select these secondary ones.

Thus, one type of directional disposition is general in nature, of longer duration, and more truly selective, while others are specific in nature and point the subject toward a particular response to a particular stimulus. The latter are really the same things as preparatory tendencies, a concept developed in learning experimentation. Since there is at present no general agreement on terms to distinguish these two types of directional dispositions, both of which are frequently referred to as "attitudes," they shall be distinguished in the present paper as "sets" and "attitudes," respectively. The first covers what are usually referred to as motives, interests, desires, *Aufgaben*; the latter, the positive or negative characteristics of the specific responses attached to specific stimuli. To illustrate the present proposed usage of terms, the rat may be said to run the whole maze under guidance of a set; it reacts to the particular turns and alleys encountered under the impulse of attitudes.

The Influence of Sets on Aesthetic Judgments

The judgmental data of early experimental studies of preference for simple visual objects, such as rectangles, triangles, colored papers, and line segmentation, were characterized by extreme variability. Every stimulus was usually ranked by several subjects in every possible position of merit. On the basis of casual introspections, followed by intensive studies of awareness during judgment, it became evident that the explanation for this variability lay in the subjects' differing reasons, or criteria, for choice or absolute judgment. Whereas one subject might maintain that his preference for a particular color occurred immediately and for no reason extraneous to the stimulus, another subject might give high saturation as a reason, another the symbolic meaning attached to the color, and another his preference for a girl who once wore a dress of that color. Furthermore, it was found that these varying reasons for judgment, although at first glance appearing even more numerous than the subjects, could be classified into a limited number of types. Accordingly, several doctrines of "perceptive types," or types of perception, were developed. Bullough, who, among psychologists of aesthetics, has been identified with this typing of perceptions, has published an excellent review of the early work of this nature (13). It should be emphasized that the data for this typing were differences in judgments of the same stimuli plus differences in reasons given, and that the sets were inferred from the latter to explain the differences in judgments.

Types of Judgments. (1) A large number of studies have been published which deal only with the introspective reports of awareness and reasons for preference, but which do not attempt to correlate the introspective evidence with differences in judgments of the stimuli. This is the only evidence given for Bullough's four types (11), although they have been verified in at least four subsequent studies (12, 62, 32, 24). These four types are briefly the following:

(a) *Objective.* Awareness is dominated by stimulus qualities and relationships. The set is impersonal and frequently involves preconceived standards of preference.

(b) *Physiological.* Mood and bodily reverberations dominate consciousness. The sensuous effects are taken as the basis of judgment.

(c) *Associative.* The subject is aware of some concrete meaning aroused by the stimulus. Judgment is determined by evaluation of the meaning.

(d) *Character.* Mood-like characteristics, which the subject feels to be subjective in the second type, are perceived as in the object. This is an empathic sort of response, involving a minimum of self-awareness, and may possibly be identified with "projection."

Each of these types should be conceived of as a different set which directs attention to one kind of sensory or ideational data. Other investigators have uniformly found these four types, although they have differed from Bullough in details of naming and amplifying subtypes; and they have found evidence for additional types. Bullough was inclined toward the view that these types characterized different subjects and that, consequently, individuals could be typed as well as the judgments. Subsequent investigators have failed to support him in this, however. They report that, although some subjects make more judgments of one particular type than they do of others, the large majority of subjects do not show a type-tendency. Single and paired colors, single and paired tones, geometrical forms, and words have been used as stimuli in these studies.

(2) Bullough's four types have not been reported in experiments which correlate differences in set with differences in judgments. Pratt (73) found that his subjects' preference judgments for tonal intervals fell into two distinct types, the judgments of each type being in close agreement on the relative merits of the intervals. Introspective investigation revealed that one group of subjects was using "smoothness" as a criterion; the other group was using "musical meaning" as a criterion of preference. Valentine (85),

who recorded changes in preference judgments of tonal intervals effected by repetition, reported that the values of intervals failed to change with two subjects who were found to be employing objective, preconceived criteria of relative merit. A similar correlation was reported by Harris (40) for changes in judgment due to contiguity. Nakashima (63) found a correlation between set and reported ease of the process of judgment; and Yokoyama (97) reported differences in the affective judgments accompanying the sensorial (content) set and the objective (common sense) set.

(3) Several studies of introspective data have supported conclusions of subject types, as opposed to judgment types. The types, however, have been only two in number, namely: a pattern type, or tendency for awareness to be dominated by formal, relational characteristics of the stimulus, and a representative type, in which the habitual tendency is for awareness to be dominated by the meaning of the stimulus. This tendency for subjects to fall into one or the other of these types has been most thoroughly investigated in studies of pure perception (79, 66, 35). Among studies of aesthetic judgments, it has been reported in greatest detail by Feasey (32). These two types, as subject types, deserve special mention, because of the uniformity with which they are found in separate investigations and because of related findings to be discussed later (cf. the sections on "Inverse Factor Analysis" and on "Personality").

The center of this problem of the existence of perceptive subject types lies in the generality and persistence of the types of judgments in different subjects. Experiments of the kinds described above have failed to prove that the appearance of subject types is not the result of temporary assumption of set on the part of the subject, for the purposes of the particular experiment in which he is serving.

The Influence of Instructional Sets. Although many investigators have remarked the effect of instructional set on judgments, few have made this effect the special object of study. Wells (89) had subjects judge different series of stimuli, of varying grades of complexity, under several general instructional sets, and found that the percentage of P judgments varied with the type of instructions. Legowski (54) demonstrated the effect on affective judgments, of simple geometrical forms, of specifying a purpose or use for the stimulus objects. For example, his subjects judged rectangles and triangles under general instructions and under instruc-

tions which specified use of the stimuli as calling cards and gables, respectively. The effect was evident in wide differences in relative merit for certain stimuli under the two conditions.

These studies show beyond any doubt that sets influence judgments of P and U. The particular set a subject takes in any experiment is largely determined by factors within himself, although it can be to some extent controlled by instructions. The evidence indicates, however, that sets vary in spite of specificity of instructions and other conditions at the control of the experimenter. Therefore, other methods than prearranged experimental design must be used in order to control them.

In addition to specificity of instructions, the following methods may be employed to control set: (1) practice of subject; (2) introspective reports; (3) analysis of pooled judgments for signs of bimodality, or distinctly different trends (cf. 73); factor analysis is ideally suited for this purpose; (4) recordings of involuntary reactions in order to point out atypical sets.

Attitudes

The preceding discussion is concerned with the effects of what is herein defined as "set" on aesthetic judgments. There remains the problem of the role of attitudes, the narrower form of directional dispositions, which point the subject toward or away from a stimulus. Reference to "attitudes" in this sense, and by this term, also occurs frequently in studies of aesthetic judgments, especially in connection with subjects' introspections on the judgment process. Young (98) reports "movements away" from the stimulus to be associated with U judgments of odors; in summarizing the common-sense "attitude," E. F. Wells (89) remarks that attention is directed toward the "affective significance and reactions rather than content"; H. M. Wells (92) reports that during the period preceding the act of choice between two alternative tastes, subjects' awareness is dominated not by P or U elements, but by "active tendencies." Numerous implicit references to, and occasional explicit statements of, action tendencies can be found in the voluminous protocols published in the early papers on affection. The most evident conclusion is that these specific, positive and negative attitudes *are* what the judgments of P and U, beautiful and ugly, desirable and undesirable, refer to. In other words, when the subject makes a judgment of P, it means that he is aware of a positive attitude; and when he makes a U judgment, he is aware of a negative attitude.

Although a number of psychologists have remarked the affective nature of attitudes, none of them has followed the implications into the problems of the field of aesthetics (96, p. 241; 46, p. 807). Thurstone (84, p. 261) defines attitude as "the affect for or against a psychological object," and in the same context refers to his "definition of attitude as the affective character of potential action about a psychological object." Bartlett (3, pp. 190-194), in summarizing his significant finding that attitudes occur in the first stages of both perception and recall, writes that about the only thing he is certain of concerning the fundamental nature of attitudes is that it is largely "affective." References to the specific nature of these attitudes are indeed difficult to find in the psychological literature. It is possible that the conceptual haziness about them can be dispelled by identifying them with affections, and both with disposition toward specific response. The following experimental findings lend weight to this identification of affective consciousness and tendencies toward action.

(1) The series of experiments performed around the turn of the century on Wundt's tridimensional theory of feeling (5, pp. 60-67) all agreed in finding that during experiences judged P and U, consciousness was replete with "feelings" of excitement, relaxation, tension, depression, etc., although there was little agreement on the structural nature of them. Wundt and his pupils held them to be unique contents; Titchener and his pupils held them to be kin-aesthetic sensations. For the present purpose it is sufficient to point out that each of the terms used to describe these conscious qualities is a term implying action, and that none of them connotes passivity. The old disagreement about their existential nature is resolved if they are identified as felt action tendencies, felt either as purely central (cerebral) phenomena or as bodily reverberations from consequent changes in muscle tension.

(2) Similarly, the imageless contents, especially the *Bewusstseinslagen*, which the Würzburg school found to accompany the process of judgment in general, are most easily incorporated into the fabric of present-day psychology in the form of action tendencies or attitudes.

(3) Nakashima (64) found that the reaction times of "feelings of strain, excitement, curiosity, interest, surprise or shudder, wonder (strangeness), familiarity, recognition, a certain indescribable feeling" (*Bewusstseinslagen*), were of the same order of magnitude as those for judgments of P and U.

(4) It has been fairly uniformly found that actual, though small, movements of approach and avoidance accompany judgments of P and U. The relevant studies have been summarized by Beebe-Center (5, pp. 339-349), who concludes from them that, although there is a definite correlation between P and U and opposed action tendencies, the experimental evidence does not show action tendencies to be a *sine qua non* of P-U judgments.

(5) Washburn and her collaborators (87, 88) found in two investigations that in many cases the affective values of single and paired colors could be voluntarily changed. This finding is difficult, if not impossible, to coördinate with any conception of affection other than one in terms of reaction tendencies. Some subjects actually reported accomplishing the shift in value by changing their "attitude." The methods reported by other subjects can easily be interpreted as ways of bringing about the same change.

(6) Mull's recent study (61) demonstrates the occurrence in aesthetic judgments of a phenomenon which, in the psychology of learning, has been labeled "anticipatory tendency." Subjects listened to repeated playings of a musical recording and indicated, for each playing, the parts they considered pleasant. Although each subject was highly self-consistent in the parts indicated, the pooled results showed a tendency for the original pleasant areas to spread anteriorly in subsequent repetitions. Now, anticipatory tendency is generally interpreted as merely a reaction tendency which becomes conditioned to stimuli regularly preceding the one that originally elicited it.

(7) In Peters' experiments (67, 68, 69, 70), P and U judgments of foreign words were determined by having subjects learn to pronounce or not to pronounce them when they were presented visually. Those words pronounced increased in mean affective value; the others decreased. The most obvious interpretation of this result is in terms of positive and negative attitudes. When the stimuli were presented for judgment after learning, each aroused an anticipatory tendency which was a pointing precursor of the act that had previously been learned as response to it. When the anticipatory tendency was the positive one of pronouncing, the stimulus was judged P; when it was the negative one of inhibition, the stimulus was judged U.

Inverse Factor Analysis

The logic and application of this technique to aesthetic judgments has been developed by English psychologists, who were pri-

marily interested in type or tendency factors in the judgments. In the history of the psychology of aesthetics, they represent a continuation of the trend or school which began with Bullough and his perceptive types.

The Method. Davies (21) has published an excellent review of the method and a summary of most of the studies in which it has been employed. Only a small, and relatively recent, part of these studies was concerned with aesthetics. Derivations of formulae and presentations of the logic of inverse factor analysis are to be found in recent publications of Burt (14, 15, 16) and Stephenson (81, 82).

As applied to aesthetic judgments, the original correlations are the intercorrelations of the ratings or ranks received by a series of stimuli from each individual subject. Thus, each stimulus is treated as a "test." The end-results of analysis are: (1) an estimate of the percentage of total variance in judgments due to a general factor, or factors; (2) for each subject, an index of determination of judgments by the general factor; (3) an estimate of the percentage of residual variance due to secondary bipolar, or group, factors; and (4) for each subject, an index of determination by the secondary or group factors. The first and third are statistical estimates of what are evident in the original ratings and intercorrelations of original ratings, if they are present to any considerable degree. When mean ratings are reliably different for different stimuli, and when the frequency distribution of ratings for each approaches normality, a general factor will be found. When the matrix of intercorrelations can be observed to consist of submatrices, two of high positive r 's and two of low positive, or even negative, r 's, two group factors will be found upon analysis which behave as the two ends of a single secondary, bipolar factor. The third end-result will in this case also disclose itself in the form of frequent bimodality of judgments for individual stimuli.

Results. (1) A strong general factor has been found for judgments of every series of stimuli that have been factorized. This factor determines in different experiments from 30% to 70% of the total variance, although the individual subjects' saturations with it vary widely. Beebe-Center (4) and Guilford (37) used Spearman's tetrad difference equation to factorize judgments of odors and colors, respectively. Strong general factors have been found for judgments of picture postcards of many different classes of objects, poetry, prose, odors, colors, and polygons, in different

studies which employed chiefly Burt's methods of analysis (23, 94, 41, 27, 28). In terms of the percentage of variance determined, the importance of the general factor varies with the homogeneity of subjects and the merit-range of the stimuli. It is found, for instance, that the judgments of experts are determined very highly by a general factor. In most of the studies listed above, the stimuli were selected to represent a wide range of preferences, although the subjects used were not very homogeneous in age, training, and cultural background.

(2) Eysenck (27) found evidence of the generality of this general factor from judgments of one series of visual stimuli to those of other series of visual stimuli, and from these to stimuli of different kinds and modalities. Eighteen subjects' rankings of 18 sets of picture materials were separately factorized; the 18 subjects' saturations for the 18 general factors were then intercorrelated, and the resulting correlation matrix, which was of the usual form, was factorized. A general factor was found which determined 20.6% of the variance in saturations. Eysenck proposed to call this pervasive general factor a "T"-factor, for objective (general) taste. Communalities between this T-factor and the general factors for 31 odors, 10 colors, and 64 polygons was demonstrated by correlating the subjects' saturations for each with their saturations for T. The r 's were high positive ones and reliable except in the case of colors. In a later experiment the communality of the T-factor in pictorial tests and in polygons was verified (28). Regardless of what the ultimate explanation of the T-factor may be, it certainly evidences the generality of a trait of conformity.

(3) A secondary, bipolar factor has been found to be operative to varying degrees in the variance of judgments of visual stimuli, in every case in which it has been looked for, and in several tests of literary appreciation. In four studies, employing general factor methods, this bipolar factor was found to be present, but insignificant in degree (23, 94, 27, 28). The fact is significant, however, that it was found repeatedly and that it was identified in every case in strikingly similar terms. For pictures this factor was characterized as taste for the objective *vs.* taste for the subjective, as classical *vs.* romantic (23), and as taste for the formal *vs.* the representative (27). For literature it was characterized as classical *vs.* romantic (94), and for polygons, as simple *vs.* complex (28). The methods used in these studies for identifying this bipolar factor were twofold. One was examination of stimuli on which the judg-

ments of subjects of high positive and high negative saturations differed widely. The other was comparisons of introspective reports of subjects of high positive and negative saturations.

In two papers Stephenson (81, 82) included the results of group-factor analyses of judgments of colors and of vases. Both analyses were presented primarily for illustrative purposes. However, his identification of the two group factors found, in each case, parallels those for the bipolar factors arrived at in more thorough studies which used general factor techniques. In the case of colors, he identified the two group factors as taste for subtle, subdued colors and taste for bright and vivid colors. In the case of vases, they were identified as taste for simple form and taste for the ornate and realistic. Stephenson apparently picked his subjects for both experiments on the basis of heterogeneity of taste.

(4) Eysenck (29) has recently published the one study in which a definitely significant bipolar, or "type," factor was found. He selected stimuli of about equal merit, on the basis of judgments obtained in previous experiments, in order to increase the relative influence of the bipolar factor and to diminish that of the general factor. The bipolar factor was also boosted by using subjects of heterogeneous training and cultural background. He identified the resulting strong bipolar factor, for each of five sets of pictures, as choice of the older, conventional, less colorful *vs.* choice of the modern, impressionistic, and colorful. He furthermore demonstrated a communality of the bipolar factors in all five tests and proposed the name "K"-factor for this general bipolar factor.

These studies disclose enticing prospects of experimental possibilities, in the way of measuring and psychologically defining the nature of the general factor, or factors, and the nature of the group factors. These English studies have done nothing toward identifying the general factor; all they have done is measure it. As for their identifications of the group factors, their weakness lies in definition. They have all made the stimulus error. Stimulus characteristics, such as form, representativeness, classical, romantic, simple, complex, were treated as if they were variables of the physical stimulus with existence independent of any reacting subject. These characteristics should have been given psychological definition. The most obvious procedure would have been to have the same, or a comparable, group of subjects judge the stimuli for form, representativeness, simplicity, etc., and measure these qualities in much the same way P-U was measured. Or any of the techniques employed

in perception experiments, such as brief exposure, could have been used to measure these characteristics psychologically. As it is, the reader's confidence in the stated nature of the type-tendencies depends on his opinion of the investigator's saturation with the general factors for judging form and meaning, simple and complex, and the other stimulus qualities in question.

It is highly significant that these studies, as well as those outlined above on type-tendencies disclosed in introspections, should find only two types and that all experiments of both kinds should identify the two corresponding *sets* in terms suggestive of *form* and *meaning*.

Personality

Experimental studies of stimulus preferences and personality have been few in number and for the most part ambiguous in results.

Carroll (18) found Pearson r 's of $-.18 \pm .07$ and $-.11 \pm .07$ between extroversion, as measured by the Bathurst test, and the Meier-Seashore and McAdory art judgment tests, respectively. Burt (17) reported characteristic differences in central tendencies among picture preferences of extroverts and introverts. Preferences of the former leaned toward the meaningful (romantic and realistic); those of introverts, toward the formal (impressionistic and classical). Eysenck (29) correlated a test of the K-factor, in which preferences for bright, modern pictures were scored high, and preferences for subdued, conventional pictures scored low, with measures of E-I and of radicalism-conservatism. Measures of both personality traits were the means of two judges' ratings and a paper-pencil test, Heidbreder and Vetter, respectively. He found the same reliable correlation in both cases, $+.72 \pm .13$ (σ). Sisson and Sisson (78) compared the mean scores on the Allport-Vernon Scale of Values test obtained from two equated groups, one composed of introverts, the other of extroverts. The Bernreuter test was used to identify the personality tendencies. The only difference even approaching reliability was that between scores for aesthetic value (C. R. = 2.51). This mean difference implied that introverts place greater value on the appearance side of things than do extroverts.

While none of these sets of results is to be considered highly significant, the uniformity of the finding of a difference between extroverts and introverts is suggestive of a true difference. The indications are that introverts prefer the formal, extroverts the meaningful. Besides being in accord with general opinions about introverts and extroverts, this indication can readily be interpreted in terms of the view which identifies affection and reaction tendency. If introversion is the tendency to attend to one's own

bodily reactions, including attitudes, and if aesthetic judgments are actually reports of observers' attitudes, one would expect introverts to be more familiar with their attitudes, as well as their stimulus conditions, than extroverts. And furthermore, as a consequence of his more frequent aesthetic experiences, the introvert would be expected to have abstracted the generalized formal elements of appearances from the particularized meaningful elements, at least to a greater extent than the extroverts, and consequently show greater relative evaluation of the former.

Aesthetic Judgments and Emotion

This is another relation that is in need of definition and clarification. There are few people who doubt that emotion and P-U are intimately related; but the question of precisely *how* is seldom given a specific answer. Most of the early studies of affection and bodily indicators of emotion are useless for our present purposes, because affection and emotion were not clearly distinguished. Also, most of these studies (cf. 5, pp. 318-325) have vainly sought differential patterns of physiological responses for P and for U and have not sought a correlation of these responses, as indicators of emotion, with judgments of P and U, which is our present interest. This correlation has, however, been fairly thoroughly investigated in the case of the P. G. R., and some highly significant findings reported.

(1) Two studies found no relationship between degree of preference judgments of stimuli and the extent of mean P. G. R. deflection (32, 25). A large P. G. R. was observed to occur only in isolated instances of extreme P or U. The stimuli used in these two experiments, rectangles, geometric forms, and words, were not ones calculated to be uniformly either very exciting or intensely P or U.

(2) One experiment, by Shock and Coombs (76), did find a relationship, but one that was far from perfect. Odors were used as stimuli with high school girls and boys as subjects. The stimuli were judged on a five-point rating scale (VU, U, I, P, VP). The plot of mean deflection on mean rating showed a U-curve for the girls, with the most reliable difference being between mean P. G. R. for VU and mean P. G. R. for the other categories, which were themselves not greatly different. The curve for boys was not U-shaped at all, but L-shaped, with the VU category standing alone, and well above the others in P. G. R. These results accord in general with an opinion, shared by most normal people, that VU odors are more frequently emotion-arousing than are VP odors.

(3) Two studies have shown fairly conclusively that P. G. R. is not associated with P or U directly, but with the conditions generally considered determinants of emotion. One of these studies (92) was an investi-

gation of the act of choice. The procedure briefly was to present for choice eight tastes of varying preference values, each stimulus taste being paired with every other one. It was found that P. G. R. was well above average when the members of a pair were of nearly equal value (P—P, I—I, U—U) and was well below average when the two stimuli of a pair were of widely different values (P—U, P—I, U—I). Now, if P. G. R. were related directly to degree of P or U, P—P and U—U pairs should have caused much greater deflections than I—I. The results show instead that P. G. R. is correlated with conditions favoring conflict of action tendencies.

The second experiment is one recently published by Lanier (53). His subjects responded to stimulus words with one of four categories, P, U, I, and M (mixed). He found no difference in P. G. R. for the three judgments P, U, and I, but did find a significantly high mean deflection for M judgments and for *individual* responses in the other three categories, *i.e.* a response given by only 1 subject in 38. Both the M and the individual judgments were relatively infrequent. M judgments were by definition conflict, or indecision, judgments; individual responses are among the generally accepted indicators of emotion.

The results of these experiments favor the conclusion that P. G. R. is not a direct correlate of P and U judgments. In none of the experiments does P. G. R. appear to be an invariable accompaniment of such judgments. Taken as a whole, however, these studies indicate that P. G. R. accompanies P and U, as well as I, judgments when the affective states underlying the judgments are emotional in nature, specifically when (a) the stimuli are tastes and odors and when (b) the response is one of conflict or indecision. These facts, and the close association that has been established between P. G. R. and emotional excitement, point to a conclusion concerning P and U judgments which certainly does not distinguish them among the family of human reactions—namely, that such judgments are sometimes accompanied by emotion, sometimes not.

In order to clarify the relation between affection and emotion, it is necessary to distinguish three terms: affective judgment, affective state, and emotion. The first is the datum, and is operationally definable in terms of method. Affective state, or affection, has been identified in this paper with attitude, or reaction tendency toward or away from. When affective judgments are made, affective states are present either actually or symbolically. The third term, emotion, may be defined, as the derivation of the word itself implies, in terms of movement. It is inferred from any activity in which the subject is strongly moved, impulsively, involuntarily. According to this definition, any response may be said to be emo-

tional to the degree that it is itself strongly impulsive or is accompanied by other, conflicting, strongly impulsive responses. Thus, when attitudes are only symbolically present, the P and U judgments will be entirely lacking in emotionality. When the attitude is actually present, the P-U judgments will be emotional in direct proportion to the strength of the attitude or to the strength of correlative action tendencies.

II. PERCEPTION

Every aesthetic experience is also a perceptual experience. This, of course, can be said of every distinguishable type of human experience, but the identity in the case of aesthetics is universally considered closer than for most other types. The really important thing to notice, however, is not the similarity of the two in the abstract, but the similarity in the concrete, experimental operations used to measure each. In both kinds of experiments the uniform elements are the following: The subject is given a set to direct attention to some particular stimulus quality; stimuli are presented to him; and he is required to report in the form of judgments of the quality. Variations of methodological details in one are paralleled by corresponding details in the other. The one crucial difference between the measurement of value and the measurement of other stimulus qualities lies in the set; in aesthetic experiments subjects are set to observe and judge value; in perception experiments they are set to observe and judge such stimulus qualities as unity, organization, finality, etc. Thus, the two concepts are related as species and genus; aesthetic experience is a form of perceptual experience.

Many stimulus qualities, such as unity, rhythm, fusion, balance, proportion, are undoubtedly among the determinants of aesthetic value. In many aesthetic studies, judgments of qualities such as these have been treated either as themselves value judgments or as judgments of factors directly correlated with value judgments. However, the exact functional relationship of aesthetic value for any type of stimulus with any of these other qualities is not known, and obviously it could not be one of identity with all of them simultaneously, since any particular stimulus possesses them to varying degrees. Instead of assuming here a relationship of identity, it should be considered an extremely significant *possibility* that the objective (general) factors operating to produce uniformities in group preferences are in large part the same ones

which determine perceptual principles, or laws of stimulus relationships. The "formal" principles of art probably refer to some such laws of organization within the sensory field.

It should be clearly remarked that such laws refer to organization in the psychological stimulus and not in the physical stimulus; that is to say, they express ease or readiness-to-organize tendencies on the part of the subject. They are "objective" in the sense of being fairly general among all subjects.

Principles of perceptual organization are to be found aplenty among studies of perception. The nature of the laws and the techniques for detecting and measuring them have been worked out in most detail for vision by the Gestalt psychologists (52). The techniques are really methods of reducing the force of the physical stimulus in order that the *insistence* of specific relationships in the psychological stimulus, or "readiness-to-organize" tendencies of the subject, may reveal themselves. In other words, when a perceived relationship has a low threshold or is relatively defiant of disruption, it reveals a readiness tendency of the organism.

Although the Gestalt psychologists, and most of the other investigators of perceptual principles (7, 66, 30), have been well aware of the bearing of their results on aesthetics, their experiments have been perceptual experiments and not studies of aesthetics, since value judgments were not part of their data. Definite determination of the functional relationships between the laws of perceptual organization and general affective value really constitutes the central problem of aesthetics, and it remains as yet almost unexplored.

Statistical and introspective evidence has already been cited in this paper (32, 27, 29) for a formal type of set, which causes the subject to select stimuli with strong formal qualities and which competes with a representative type of set. These studies do not show, however, that the stimulus determinants, differentially weighted by subjects of the respective types, do not also contribute to determination of the general factors expressed in all aesthetic judgments.

There are many isolated experimental results which evidence a relationship between aesthetic judgments and certain organizational qualities of the stimulus (71, 74, 55, 49); relatively few, however, specifically relate value judgments to judgments of organizational qualities. Wilcox and Morrison (93) have published an excellent experiment of this latter type, an experiment which

demonstrates the fruitful possibilities of such an attack. They varied the illumination of visual patterns from a very low to a very high level and found that judgments of extreme organization in the perceptual field occurred at the same level of illumination (2.4 foot-candles) at which judgments of intense P also occurred. Pratt's study (73) showed that for tonal intervals the relationships between P-U and qualities of unity, simplicity, complexity, were not simple and direct.

Empirical Formulae of Beauty

The experiments performed by Guilford and collaborators with single colors and pairs of colors constitute genuine functional analyses of the relationships between general affective value and other stimulus qualities. In his experiment with single color stimuli (37), subjects rated stimuli for the nonaffective qualities of hue, saturation, and brightness and also for affective value. One set of stimuli were especially chosen to allow independent variability of hue, thus making experimental isolation of this quality possible. The resulting periodic curve, depicting the dependence of affective value on hue, was analyzed into two simple harmonic, sine waves. From the empirical equation derived from the sine-cosine functions of these waves, affective values of the other sets of experimental stimuli were predicted. Correlation analysis was then applied to the discrepancies in order to derive indices of determination for saturation and brightness. The end-result of such analysis is a regression equation of affective value on hue, saturation, and brightness, each of the latter being weighted according to its index of determination of affective value. Similar methods of correlation analysis were applied toward derivation of an empirical equation for pairs of colors (36, 1).

The chief significance of these studies lies in method rather than in results. They demonstrate the plausibility of applying precise methods of functional analysis toward investigation of the relationships between affective value and other qualities of the psychological stimulus. The stimulus variables need not be limited, as they are in Guilford's studies, to qualities such as hue, saturation, and brightness in single, simple colors. Strictly comparable these qualities for two-component colors. Strictly comparable methods could be readily applied to such stimulus variables as unity, fusion, complexity, and even to variables not generally considered stimulus qualities, such as familiarity, meaningfulness, and expressiveness.

Eysenck (28) has applied correlation analysis toward derivation of an empirical formula for general affective value of polygons, but unfortunately fell into the stimulus error in that he attempted to identify the stimulus variables independently of human reactions.

A Priori Formulae for Beauty

Mathematicians have in recent years contributed two formulae for beauty based chiefly on speculative postulates (8, 75). Birkhoff's has attracted fairly wide attention among psychologists. His general hypothesis is expressed in the formula: Aesthetic value = Order/Complexity. His method was to determine the positive and negative *elements* of O and of C for several types of stimuli, on the basis of his own and traditional opinions. The general formula is given particular statement for each type of stimulus in terms of its own elements. He reproduced in his book specific examples of several types of materials, including polygons, vases, and melodies, and along with each example, the aesthetic value as determined by his formula. He specifically states certain assumptions about aesthetic value which consequently makes it a restricted type of general preference value: (a) Experts excel at detecting it; (b) the experience is intuitive; and (c) connotative associations are excluded, or, in other words, it is limited to purely formal features of the object.

Several experimental attempts have been made to verify Birkhoff's formula (22, 6, 95, 10, 41, 2). Since Birkhoff presented more examples of polygons than anything else, they have been most frequently employed as stimuli. In outline, the method used in experimental tests has been to obtain the pooled rank orders, for an unselected group of adults, of a set of Birkhoff's polygons and to correlate these pooled rankings with Birkhoff's measure of their affective value. The resulting correlation coefficients have varied from +.16 to +.77 in different experiments. In the two most thorough studies (6, 41), employing several types of materials and in some cases using expert subjects, very variable results were found and negative conclusions reached. They found less agreement between experts and Birkhoff than between nonexperts and Birkhoff, and the agreement was exceptionally low for music, the most formal of all arts. In general these studies of Birkhoff's formula have lacked a clear and significant criterion in terms of which to evaluate the degree of correlation found between the empirical pooled values and the predicted values. The obtained correlation

coefficient should be compared with one expressing the reliability of the pooled values themselves. A very useful criterion would be the estimated correlation between the obtained mean ranks and the mean rank orders for the whole population of subjects (26).

In fairness to Birkhoff, it should be stated that in none of these experiments was extreme care taken to observe at the same time all three of the assumptions given above.

The chief criticism to level against Birkhoff's method is that it commits the stimulus error. The elements of order and complexity are defined in terms of the physical stimulus and not in terms of the psychological stimulus. The only significant measures of order and complexity, ones which could be universally applied by any investigator to any type of materials, are measurements in terms of reactions, judgmental or otherwise, of subjects belonging to the population in question and not in terms of hypothetical elements of the physical stimulus. Complexity has been variously defined by Birkhoff and others in terms of such elements as number of separate units (sides in the case of polygons) or as ratio of width to length (for rectangles), as if it were entirely independent of the observing subject and the number of times he has observed the stimulus. Yet it is evident from everyday experience that the complexity of any particular object varies from subject to subject and from time to time for the same subject. Definition of a quality such as complexity in terms of physical elements should at least take into account some Weber Fraction.

Immediacy of Affective Judgments

The problem of whether affective awareness is mediate or immediate in nature is an old one in the history of affective experimentation, and, although it has received scant attention in recent years, is still a significant one. It is likely that with a little practice and related discussion of terms with the experimenter, any subject of normal intelligence could confidently and reliably make reports of mediacy or immediacy of judgments. This problem has a direct bearing on the content-view of affective consciousness, for, if there be a special sensorial content comparable to redness, coldness, etc., awareness should be immediate. It also bears on the possible *intuitive* nature of aesthetic awareness, for, if there be any unique characteristic of intuition, as a type of awareness, it is immediacy.

Studies in which reports of mediacy or immediacy of judgments have been required of subjects are in fair agreement on three con-

clusions (42, 63, 64, 97, 92, 65, 89): (1) The awareness of P or U may be either mediate or immediate; (2) with a passive set, it is more frequently immediate; (3) with increasing practice at judging a particular stimulus, the more immediate the awareness becomes (42, 92).

The significant question about immediacy is not whether or not the *judgment* itself is immediate, because the verbal judgments are, with possible rare exceptions, reports of, and therefore mediated by, preceding conscious states. The significant question is: Is the awareness, which the judgments signalize, immediate? If the affective awareness is preceded by conscious reasons, cognitive criteria, or associations, from which one can infer a *set*, then the answer is "no." If, on the other hand, there are no preceding cognitive processes; the answer is "yes." The introspective studies are replete with evidences that affective awarenesses occur in both of these manners; and this is readily interpretable if affective awareness is assumed to be consciousness of attitude toward. When a critical set selects the attitude, the state is mediate; when the attitude is a spontaneous response to the stimulus, the state may be said to be immediate. An attitude may become the direct response to a stimulus either through frequent repetition or through hereditary structure. This interpretation is favored by the finding that the more intense the P or U state reported in judgment, the shorter the reaction time.

Reaction Time

Although there have been a number of investigations of the latent times of affective judgments (56, 63, 64, 72, 90, 91, 51, 53), the mean times, as well as the experimental conditions, are so variable from one to another that any conclusions extracted must necessarily be very general. The results indicate that mean affective reaction times are longer than simple sensory reaction times, that affective reactions are absolutely more variable than sensory, and that there is no difference in P and in U reaction times.

Introspective reports of four studies (63, 64, 65, 89) agree in finding that relative latent times of affective awareness are longer than for sense awareness. With respect to perception and affection, however, there is no agreement on which usually precedes, although there is agreement on the finding that sometimes affection does precede perception and that any existing mean temporal difference is very small.

Reaction time has been found to vary inversely with degree,

and difference in degree, of affection in seven studies. When the method of single stimuli is used, reaction times are shorter for extreme degrees of P and U than for intermediate degrees (56, 72, 51, 53). When the method of paired comparisons is used, reaction times are shorter for large differences in the affective values of the two stimuli than for small differences (97, 91, 20).

Since there are undoubtedly as many different reaction times as there are combinations of the different stimulus modalities, degrees of complexity, different sets, levels of practice, degrees of meaning, and degrees of affective value, the significance of reaction time for studies of aesthetics lies in its methodological use rather than in determination of just what it is. Thus, as an indicator of atypical judgments, it may be used as a check control on mediacy or immediacy of judgments, degree of value reported, or subjective variation of set.

III. EXPERIENCE

The Learning Aspect of Aesthetic Judgments

Anyone who can successfully catch an objective glimpse of his own everyday evaluating judgments readily recognizes them as, for the most part, learned reactions. The learning aspect of value judgments is even more apparent in the experimental situation. In the typical affective experiment the subject does not have ready-made affective reactions for the stimulus materials presented him. He has to be instructionally motivated to produce aesthetic judgments, just as he has to be motivated to learn a list of nonsense syllables. Not only are the reactions recorded really solution responses, but in most aesthetic experiments the subject is called upon to repeat his judgments with varying frequencies, which is tantamount to the practice phase of the learning process. This analogy has been pointed out and discussed by McGeoch (58), and it has been supported by Hunt and Flannery (48). The following list of experimentally established characteristics of repeated affective judgments, each of which can be readily matched with a characteristic of repeated responses in conventional learning experiments, removes all doubt of the significance of this analogy.

- (1) Individual variability of response judgments decreases with repetition (45, 48, 77).
- (2) Group variability of affective judgments also decreases with repetition (45).
- (3) With repetition of judgments, reaction times decrease (72, 97, 51).

(4) With repetition, subjects report that affective judgments become increasingly more immediate, easy, and natural (42, 63, 97, 92). This can be interpreted as evidence of the "shunting" phenomenon, or elimination of unnecessary response details, so characteristic of the learning process.

(5) One investigation (61), previously referred to, has produced graphic exemplification of the anticipatory tendency, a prevalent learning phenomenon.

The Effect of Repeated Presentations

The effect on affective value of repeated presentations of stimulus has been found in general to be twofold. One effect is temporary; the other, relatively persistent. The temporary effect, called "habituation" or adaptation, is found when the presentations are continuous and the judgments are made simultaneously with each presentation or immediately following a series of them. The persistent effect is found either when the presentations are spaced and the stimulus judged each time it is presented or when continuous presentations are used and judgments are taken after lapse of a considerable rest period. This effect is usually called "familiarity." These dual effects are admirably demonstrated in an experiment by Verveer, Barry, and Bousfield (86). They repeatedly and continuously played a piece of music to subjects on two occasions separated by a week. The subjects rated each playing. The change in mean rating for each continuous period was found to be the same—after a small initial rise, mean affective value fell to a level definitely below the original value. The persistent effect was revealed in the difference between the initial mean values for the two periods, the second being reliably higher than the first.

Most of the relevant studies have been concerned with the relatively permanent effects of frequent repetition. The procedure in outline has been to have subjects judge a series of stimuli for P-U; to present the stimuli repeatedly, usually with a time interval between series presentations, with or without requiring the subjects to judge the stimuli; and finally, to have the subjects judge each stimulus in the series again.

Results have shown that the effect of repetition varies with the individual subject. For the majority of subjects, it is one of increased P in varying degrees; for a smaller number, there is no effect; and for a smaller number still, the effect is one of decreased P. The stimuli employed in experiments yielding these results have been melody endings (31), musical recordings (34, 61), quarter-tone music (59), tonal intervals (60, 85), disliked tasks (83), pictures (56, 57), and foreign names (57).

Three experiments found either no definite shift in mean value or a

shift of both originally P and originally U stimuli toward I. These studies have employed odors (99, 5, pp. 243-246) and tastes (43) as stimuli.

Two studies in which the stimuli were jokes found that frequent repetition resulted in a fall in mean affective value (44, 19).

The detailed results of these experiments show clearly that, although increased P is more frequently than not a consequence of repetition, the effect in any one instance depends upon other factors. It obviously varies with the subject. Meyer, for example, found that listening to his quarter-tone music resulted in decreased P for 2 subjects out of 14. Valentine found that the increased P of dissonances depended on the subject's set. If the set was a critical one, the usual change did not occur with repetition. The effect of repetition also depends upon the stimulus, as shown by the different mean shifts in P for the different experiments. Tastes and odors show a shift which is different from that for complex visual and auditory stimuli. The P values of repeated concords vary with different intervals, and for all of them the change in value differs from that for discords (60, 85). Repetition in one experiment was found to cause increased P of classical recordings but not of jazz recordings (34). Hollingworth (44) found that, although the mean absolute judgments of all jokes fell with repetition, the mean values of certain particular jokes rose.

The purpose of these experiments has been to determine the correlation between repetitions of the physical stimulus and judgments of P and U. They have tacitly assumed that familiarity, a quality of the psychological stimulus, varied directly with the number of repetitions. Answers to the problems created by the apparent dependence of the effects of repetition on other factors than sheer repetition can only be sought in study of the nature of the psychological stimulus. (a) For one thing, the assumption that familiarity of the psychological stimulus varies directly with repetition of the physical stimulus, while in general undoubtedly true under the experimental conditions, cannot be taken for granted in any particular case. It certainly does not follow from the fact that the members of a particular set of stimuli have never been presented to a subject before that they are all equally unfamiliar to him. Furthermore, one would expect the functional relationship between repetition and familiarity to depend upon the complexity of stimulus and the set of the subject. (b) Repetition can radically change the psychological stimulus in different ways. This is banally true of jokes. However, other types of stimuli are not free

from similar, gradual and sudden alterations with repetition. Sudden change is graphically illustrated in pictures containing concealed objects. Once the concealed object is perceived, the psychological stimulus is not the same one it was before. As long as only the physical stimulus and its repetition are taken into account, such changes in the psychological stimulus go undetected. (c) The original P value of the stimulus is obviously an important factor to consider in measuring the determining influence of repetition, or any other condition, on P value.

Peters' experiments (67, 68, 69, 70) are a clear demonstration of the dependence of the effects of repeated presentation on other factors than sheer repetition and point specifically to the responses of the subject.

In one experiment conducted by Barnhart (2), the familiarity, as well as the aesthetic value, of psychological stimuli was measured, thus making a correlation between the two possible. His subjects ranked a set of 16 polygons for familiarity and for P. The plot (not included in the original article) of mean P value against mean familiarity value reveals that the extremely unfamiliar polygons were uniformly low in preference value, while the extremely familiar polygons were either very high or very low in preference value but never indifferent. This indicates that unfamiliarity is associated with U judgments; and familiarity, like reaction time and P. G. R., is related to the degree of affective value but not to the direction.

Contiguity

Is the preference value of a stimulus influenced by appearing contiguous to another stimulus of more intense preference value? Or, stated in another way, is there a tendency for the affective quality of one stimulus to shift to neighboring stimuli? Since there is an established tendency for judgments to be relative, according to which any stimulus of intense P or U value induces the opposite value in its neighbors (39), complete measurement of associative shifting of preference value would necessarily require isolation of the effects of relativity.

Thorndike (83) has published the results of a series of experiments, all of one type, from which he concludes that contiguity does not hold for affection. His procedure was to present a set of test stimuli under two conditions, in one case mixing them with "good" stimuli of the same kind, in the other mixing them with "bad" stimuli of the same kind. During presentation the subjects

were instructed simply to observe the stimuli with intent to recall. Poems, pictures, words, Christmas cards, and colors were used as stimulus materials in different experiments. The results showed no difference in the mean affective values of the test stimuli following the two kinds of determination.

This series of experiments is subject to the criticism that the affective values of the "good" and "bad" determining stimuli were not established. It is not obvious that the positive and negative determining stimuli would have aroused corresponding affective states in the subjects, even if they had been set to judge value; and it is certainly not apparent that without the set, any affective value was present at all. The "good" and "bad" stimuli were ones so judged by traditional and conventional opinion and not by these particular subjects or even subjects of the same population. Thorndike specifically states that arousal of a set for making affective reactions to the stimuli during determination was carefully avoided; and the stimuli used in these experiments were not ones calculated to arouse spontaneous affective reactions. Thus, these results are inconclusive with respect to the effects of contiguity of preference values. They show only that the affective values of test stimuli are not affected by appearing with stimuli which might have been judged P or U if the subjects had been called upon to judge them.

In another series of experiments in which the same materials were used, Thorndike presented test stimuli under the same determining conditions, with two exceptions; during determination the subjects were required to judge relative merit, and authoritative suggestions anent the absolute merit of both test stimuli and inducing stimuli were given. When the test stimuli appeared with "good" determiners, the subjects were told that all the stimuli were of high merit; when they appeared with "bad" determiners, they were told that all were of poor merit. The results of these experiments uniformly showed a reliable difference in mean affective value of postdetermination reports between test stimuli which appeared with "bad," and those which appeared with "good," stimuli. From these results Thorndike concludes that contiguity plus authoritative suggestion does affect subjects' judgments of neutral stimuli. There is nothing in the data, however, which indicates that the mean difference in value was not entirely due either to the prestige suggestion or to the affective reactions aroused by the determining stimuli plus the *set to judge* relative merit.

The experiments on pure contiguity, described first, were intended as control experiments to measure the effect of contiguity alone. The difference in the results of the two sets of experiments was explained in terms of the presence of suggestion in one and not in the other. The very vital factor of set to judge value, which was also present in one and not in the other, was overlooked.

The difficulty here lies, as usual, in a confusion of the physical stimulus and the psychological stimulus. P and U are qualities of the psychological stimulus, and subjects' reactions are the only indicators of their presence or absence. They cannot be controlled by manipulation of physical stimuli alone, because the preference value aroused by any particular physical stimulus is not an invariable consequence of its presentation. With a very few stimuli, such as a pinprick, sudden loud noise, or sugar on the tongue, the affective state is almost invariable; but with the majority of stimuli the arousal of an affective state is dependent upon the presence of a *set to observe value*. If the problem of contiguity has any significance at all for affection, it pertains to the juxtaposition of affective states. Consequently, a test of the effect of contiguity must include measures to insure the arousal of the affective states.

In another series of experiments, reported in the same source, Thorndike clearly demonstrates the influence of *suggestion* on affective judgments.

It has been demonstrated in three experiments that associative shifting of affective value does occur. In each of these experiments, it should be noticed, the affective values of the test stimuli were determined prior to being presented together with others, and affective values were aroused during the contiguous presentations, either by giving subjects the set for selecting affective reactions or by using stimuli which arouse spontaneous affective reactions.

Harris (40) had subjects judge the affective values of 20 colors under two conditions, namely: when every other stimulus presented for judgment was one of nine very P odors, and when every other stimulus presented was one of nine very U odors. The effects of contiguity appeared in the reactions of subjects who did not report a critical set. Their post-determination judgments of the colors showed a higher mean value after presentation with P odors than after presentation with U odors.

Staples and Walton (80) had 13 children judge primary colors by the method of paired comparisons before and after the following determination. One U color was chosen for each child and repeatedly presented, for 15 to 20 experimental periods, with a box containing something the child liked very much, such as a toy or piece of candy. Before the child was allowed to open the box, his attention was called to the colored light.

The subsequent judgment test showed a reliable shift in the pleasantness of the test color, a shift to be expected on the basis of contiguity. The effect was found to transfer to colored boxes and papers and to persist for longer than five months.

Gauger's investigation (33) was a true conditioning experiment. Children's reactions to distasteful fluids, consisting of two salt solutions, egg white, and vinegar, were modified by repeated pairings with a small square of chocolate. The chocolate was presented immediately after each distasteful stimulus. A child's reaction to each presentation of a stimulus was rated by two reliable judges on a scale of "satisfaction-dissatisfaction." The mean of the two ratings was the measure of the P value of the psychological stimulus on any one occasion. Each taste was paired with chocolate once a day for 35 days. The curves for progressive change in preference value of the distasteful stimuli each rose to indifference or above; and the value of chocolate fell progressively toward, but did not reach, indifference.

CONCLUSION

Concerning the nature of the affective state, aesthetic experience, or pleasantness and unpleasantness signalized by affective judgments, the following conception is in part supported by the studies surveyed and serves to coördinate theoretically the whole of them. P and U are positive and negative reactions which may exist in all degrees of overt expression, from a centrally confined preparatory tendency to an observable muscular movement, or which may be nonexistent but symbolically present in some surrogate. These reactions may occur spontaneously, as immediate reactions to the stimulus, or they may be mediated by a set, a cognitively defined criterion, and/or an assumed *Aufgabe*. In the latter case, the positive and negative reactions are actually selected by the set. Accordingly, the affective state is conceived as a type of *response* and may be considered the product of the same determinants which produce other responses, especially motivational selection, inherited predisposition, and associative shifting.

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PSYCHOLOGY AND THE WAR

STEUART HENDERSON BRITT, *Editor*

UTILIZATION OF PSYCHOLOGISTS IN THE ARMY AIR FORCES, AND IN THE ARMY'S CLASSIFICATION PROGRAM

In the April issue of the *Psychological Bulletin* a description was given of the services of the Office of Psychological Personnel of the National Research Council and of the National Roster of Scientific and Specialized Personnel with reference to the most effective utilization of psychologists who enlist in or are inducted into the Army. It was mentioned there that psychologists are being used both in the testing of Aviation Cadets for the Army Air Forces and in classification and personnel work in the Army.

(1) The former program has already been discussed in the March issue of the *Bulletin*, as well as in releases sent out by the Office of Psychological Personnel, National Research Council, to interested persons. The procedure for securing assignment to Psychological Research Units in the Army Air Forces is described below in detail:

(A) A man with training in psychology may wish to secure permission to *volunteer* as an enlisted man in the Army Air Forces. In granting such special permission, *preference will be given to men with graduate training in psychology*; but men with an undergraduate major in psychology who are qualified to use psychological laboratory apparatus and administer psychomotor tests under the supervision of psychologist officers may be considered.

(1) The man should write to the Headquarters of the Army Air Forces, Attention: Air Surgeon, War Department, Washington, D. C. He should specify (1) his name in full, (2) date and place of birth, (3) Local Board number and his own order number, (4) four personal references, (5) his education and experience, and (6) his special training in psychology and testing.

(2) If he is acceptable as a Psychological Assistant, he will be sent a letter to that effect.

(3) Recently enlistments in the Army Air Forces have been closed; but, if the man is acceptable as a Psychological Assistant, a special request for his recruitment can be made through military channels. If he receives a notification that such action has been taken, he should contact his local Recruiting Station periodically

to see if authority for his enlistment and assignment to a Psychological Research Unit has been received.

(4) Military training will be the responsibility of the Commanding Officer at the Air Corps Replacement Training Center and will probably be given concurrently with psychological work duties.

(B) A man with training in psychology who expects to be *inducted* soon may desire to be considered for assignment to psychological work in the Army Air Forces. In such cases, *preference will be given to men with graduate training in psychology*; but men with an undergraduate major in psychology who are qualified to use psychological laboratory apparatus and administer psychomotor tests under the supervision of psychologist officers may be considered.

(1) The man should write to the Headquarters of the Army Air Forces, Attention: Air Surgeon, War Department, Washington, D. C., at least three weeks prior to his date of induction. He should specify (1) his name in full, (2) date and place of birth, (3) Local board number and his own order number, (4) four personal references, (5) his education and experience, (6) his special training in psychology and testing, (7) probable date of induction, stating whether he has been notified definitely of date of induction, and (8) probable place of induction. If there is any subsequent change in his status, he should notify the Army Air Forces at once.

(2) If he is acceptable as a Psychological Assistant, he will be sent a letter to that effect.

(3) When the man is interviewed for classification at his Reception Center, he should state his interests to the Classification Officer and show his letter of acceptability. It is likely that he will be classified as a Psychological Assistant (Occupational Specialty No. 428), unless he is especially qualified in some other field and his services are of more value in that field. With reference to the authority for such action, the Classification Officer may refer to a radiogram, AG 201.6 (1-24-42) ST, to the Corps Area under the general subject: "Special Allotment of Enlisted Men for the Aviation Cadet Selection and Classification Testing Program." The Classification Officer should then classify the man for service at one of the Air Corps Replacement Training Centers (Maxwell Field, Alabama; Kelly Field, Texas; or Santa Ana Field, California), where assignment for duty in the Psychological Research Unit can be made by the Post Commander.

(4) Military training will be the responsibility of the Commanding Officer at the Air Corps Replacement Training Center and will probably be given concurrently with psychological work duties.

It should be noted that assignment to psychological duty in the Army Air Forces does not preclude consideration of qualified men for Officer Candidate Training, since qualified enlisted men can be recommended from Psychological Research Units for admission to Officer Candidate Schools. Following is an *estimate* of the number of psychologist officers being utilized in the Army Air Forces (as of April 1, 1942):

Officers on duty at Psychological Classification and Research	
Units.....	25
Psychologists to be utilized as officers during 1942.....	25
	<hr/> 50

(II) An analysis of the utilization of psychologists in the Army's classification program administered by the Adjutant General's Office may also be useful to those men subject to call under the Selective Training and Service Act of 1940.

First of all, under current Army Regulations, there is no way in which a psychologist who is within the age limits as prescribed by the Selective Service Act can be granted a commission immediately upon induction into the Army. Second, neither is there any means by which a psychologist in civilian life can attend any special Army course dealing with Army classification and personnel procedures; in fact, it is only after some period of time following his induction into the Army that a psychologist can usually receive special instruction in this field of work.

The decision on the deferment or induction of any given man is, of course, made by his Selective Service Local Board. If he has been put in Class I-A by his Local Board, he may then be placed in the "available for service" category. This means that a short time thereafter he is delivered to an Induction Board where he is given a physical examination by medical officers of the Army, and then, if passed, is formally inducted into the Army.

From his Induction Station he is sent to a Reception Center, where he is given one or more tests for purposes of classification. This includes the Army General Classification Test, probably certain aptitude tests, and perhaps some trade tests. Each man is also individually interviewed, either by officers or enlisted personnel, who are responsible for securing information from him concerning

his social, educational, vocational, and avocational background. He is also categorized with regard to the degree of skill which he possesses in his best occupation. Therefore, it is to the best interests both of the man and of the Army that he give complete details to his interviewer at his Reception Center about his specialized training and experience in psychology. After all data concerning a man have been properly entered on his record, a decision is reached as to his most effective utilization in the Army, and he is then assigned for training purposes to some arm or service.

A man with psychological training may, upon the completion of his test program and interviews at his Reception Center, be classified as a "Personnel Consultant." If this is the case, a report is sent from his Reception Center to the Adjutant General's School indicating the man's name, Army serial number, and the Replacement Training Center or Reception Center to which he has been assigned. Ordinarily the man is sent to a Replacement Training Center; this is the place where a soldier receives his basic military training, which lasts at least 8 weeks. He is then assigned to a Classification Section of a Reception Center or else to a Replacement Training Center, in either case being engaged in practical work of Army classification for some 6 to 12 weeks. In addition to performing straight classification duties, qualified enlisted men are often called upon to assist the Classification Officer in the administration of psychological tests, interviewing, and related duties. In some instances men have been assigned to a Classification Section of a Reception Center without first being sent to a Replacement Training Center, and in such cases they have received their basic training concurrently with their utilization in classification work.

It has been stressed repeatedly in letters sent out from the Office of Psychological Personnel, National Research Council, that there is no guarantee that psychologists will *necessarily* receive commissions in the Army. This statement is true not only at the very beginning of a man's basic military training, but also holds during the period of his utilization in classification work. In fact, even after the completion of this training he is not thereby automatically eligible to become an officer. During his months in the Army he probably has taken additional tests, and most certainly he has been rated by the officers of his unit on leadership, performance, energy, initiative, stability, and other personal characteristics essential in Army life. During the period of time that the Personnel Consultant is assigned to duty in classification work, a

report is prepared by his Classification Officer and is forwarded to the Office of the Adjutant General, setting forth in detail the type of work the man is performing, his manner of performance, and the Officer's estimate of the man's suitability for officer training. From various reports and recommendations thus submitted, a roster of qualified Personnel Consultants is prepared, and a Board of Officers selects from the entire roster the quota of qualified Personnel Consultants to attend the next Officer Candidate School.

If a man is not selected as a potential officer—that is, to attend an Officer Candidate School—he continues the activities in which he is engaged as an enlisted man, and he may be promoted as his manner of performance warrants and as vacancies occur. He may of course, be assigned to nonpsychological duties, although the chances are that a man with psychological training will continue to be used to assist in some type of personnel, classification, or testing work.

If a man is selected as potential officer material—and many psychologists are—he is sent for training to the Adjutant General's Officer Candidate School for approximately 12 weeks. There he receives an intensive course of instruction in Army personnel procedures and classification work. Upon completion of this training he probably will be commissioned as a Second Lieutenant. If a man is not commissioned after attending Officer Candidate School, he still will probably be utilized in classification or testing work.

However, if a Personnel Consultant successfully completes his course of training in the Officer Candidate School and is at that time found to be physically fit, he will then be detailed to attend a special course of instruction at the Adjutant General's School, Fort Washington, Maryland, for Military Personnel Consultants only. This course is conducted by qualified psychologists who have had extensive experience in the field of psychology while on duty with troops. Upon graduation from the Adjutant General's School, the psychologist is returned to one of the various units to perform the duties of a Military Personnel Consultant. This means that he may be assigned to the Classification Section of an Army, Army Corps, Division, Corps Area, Overseas Department, Special Training Unit, Replacement Training Center, or Reception Center. From this time on, promotion (as for any officer) depends upon quality of performance and number of vacancies.

The following brief outline indicates (as of April 1, 1942) the use being made of psychologists who hold commissions in the Army and the training program that has been developed for enlisted men who are qualified psychologists and for whom recommendations for commission as Second Lieutenants, Army of the United States, have been submitted. These figures are *approximations* only; they do not include those given above for the Army Air Forces.

Officers on duty as Military Personnel Consultants.....	50
Officers receiving special training in military psychology...	25
Enlisted men being trained as psychologist officers.....	25
Enlisted men to be trained as psychologist officers during 1942.....	100
	<hr/> 200

In other words, the total number of psychologists to be utilized as officers in the Army during 1942 is in the neighborhood of 250. Many others are being and will be used in psychological duties as noncommissioned officers and as enlisted men.

STATEMENT FROM EMERGENCY COMMITTEE IN PSYCHOLOGY

The following statement has been received from the Emergency Committee in Psychology:

The Emergency Committee wishes to reaffirm its belief that the best interests of psychology during the war period demand (1) a thorough grounding in the fundamentals of the science, with laboratory and field experience, and (2) the maintenance of high standards of proficiency and scholarship in all courses in order that the values which have produced the present high status of psychology may not be lost during the present period. So far as the Emergency Committee can learn, there is no special program of training which might be designated as Military Psychology which can be set down as prerequisite for psychological service in the armed forces.

VOLUNTEERS FOR OFFICER CANDIDATE TRAINING

The following information may be of interest to psychologists, although it applies to men in various occupational groups. Men between the ages of 18 and 45 who have been, or are entitled to be, classified in Class III-A may volunteer at their Selective Service Local Boards for induction through the Selective Service System into the Army of the United States. All expenses incident to travel to

and from and retention at the Reception Center or Replacement Training Center for the purposes of submitting to the qualification examination, including meals and lodging, will be borne by the registrant who has made application for voluntary induction to compete for selection as an Officer Candidate.

The average period of basic and Officer Candidate Training for any registrant accepted will be from six to nine months, during which time he will receive the same rate of pay as a private inducted into the Army of the United States, at the present time \$21 per month for the first four months and \$30 per month for the remainder of the training period, unless his rate of pay is increased by reason of his promotion. In the event that he is found disqualified at any time during his training period or is found disqualified to receive a commission as an officer in the Army of the United States, he will at his request be released from active duty and returned to his home, and will not again be required to undertake active duty unless and until other men in the same status with respect to persons dependent upon them for support are being inducted into military service.

WAR WORK OF THE DEPARTMENT OF PSYCHOLOGY OF YALE UNIVERSITY

The following members of the department of psychology of Yale University are working full- or part-time in work in connection with the war:

Leonard W. Doob, social psychologist who is on leave of absence from the University, is employed now with the Office for Emergency Management in Washington. He is in charge of the analysis section of the Office of the Coordinator of Inter-American Affairs, under Nelson Rockefeller. In this capacity, he supervises a staff in the analysis of public opinion in Latin American republics, and Axis propaganda directed at them. He also analyzes the effects of American activities in this respect and makes recommendations to all divisions of the office on the basis of his findings. Doob is the author of "Propaganda."

Neal E. Miller has recently been granted a leave of absence to accept a commission in the Army Air Force, where he is engaged in the pilot selection program and in research on problems of emotional adjustments in aviators.

Judson S. Brown, instructor in psychology, has been commissioned First Lieutenant in the Army Air Corps and will be engaged in psychological research under the direction of Colonel Harry G. Armstrong.

Several members of the department, including Mark A. May, Neal E. Miller, Judson S. Brown and Robert R. Sears, have been engaged in

New Haven in the Air Raid Warden Training Program giving addresses on the prevention of panic.

Walter R. Miles, professor of psychology, is a member of the National Research Council, studying aviation medicine, sound control in vehicles, aircraft pilot selection and training and night vision. He is a member of its Emergency Committee in Psychology. He is also chairman of the National Research Council Committee on Problems of Neurotic Behavior.

Robert M. Yerkes, professor of psychobiology, is expert consultant to the War Department and a member of the National Research Council's Emergency Committee in Psychology.

Carl I. Hovland, assistant professor, is co-author of the intelligence tests used by the Navy Air Corps in selecting candidates. He is unofficial adviser and consultant in aviation testing both in this country and in Canada. In addition, under the auspices of the War Production Board, Hovland is statistician and industrial psychologist for a group studying working arrangements in war industries. He has recently been appointed expert consultant to the Secretary of War.—*Science*.

BOOK REVIEWS

FAY, J. W. American psychology before William James. New Brunswick: Rutgers Univ. Press, 1939. Pp. x+240.

This is an important book because it is the first, and a successful, attempt to tell the story of the origins and development of *psychological* thought in America up to 1890. The task probably need not be done again. Historians of philosophy and of psychology have given American psychology short shrift. "Prior to 1880," the author quotes Gardner Murphy as saying, "the only important American contributions were a few articles by James during the decade of the seventies." Fay's answer is that from the point of view not of "current interest in what is called 'scientific psychology,'" but of the interests of the contemporaries who did the reading of them, American contributions were, on the contrary, highly important. His book therefore savors of an *Ehrenrettung* of pre-Jamesian thinking.

It is well written, in flowing essay style, often lively, not untouched by humor, and with good sense of proportion. It is thoroughly but considerately documented. "Notes" are gathered into 46 pages following the 166 pages of unimpeded text. At the end there is a valuable chronological table of American, in parallel with foreign, sources, and a full bibliography, alphabetically arranged by authors, of the primary American sources alone. This bibliography lists 83 titles, all books, a total of some 29,559 pages. When one remembers that Wundt wrote 53,735 pages (Boring's figures) in 68 years, the record of all America for the 137 years covered by the bibliography seems like Yankee reticence.

Fay's purpose is clearly put, and he sticks to it: "... the essential facts in the development of American psychology are presented and evaluated in the light of contemporary European psychology, and not according to criteria set up by the science of today with essentially different aims, techniques and objectives." He divides the development into three periods, and the essay into three corresponding chapters. First comes the *Period of Theology and Moral Philosophy*, with two sub-periods — *English Scholastic Education*, 1640 to 1714, and the *American Enlightenment*, 1714 to 1776, a total of 136 years.

The first 74 years, to 1714, were pretty sad. The temper of mind of Puritan New England was pathetically provincial and isolated even from much of contemporary British thought, although the proportion of learned men who had come from English universities was exceptionally large. They brought with them the traditional lore that they had been taught. The tide of seventeenth-century science in Europe (Copernicus, Newton, Hobbes, Descartes, Locke) had hardly touched these shores. American scholars were indeed warned against such new thought, as they were a bit later against Berkeley and Boyle; religion should not be corrupted. In consequence "no single product of American scholarship in any field whatever" appeared during these nearly eight decades. The

teachings were "Plato shorn of his poetry, Aristotle without his breadth . . . , Thomas Aquinas without his logical subtlety."

Somewhat less sad, but still slow-coach, was the second (62-year) phase of the first period, up to the Revolution. Fay terms it the *American Enlightenment*, for about 1714, twenty-four years after he published his *Essay* in England, John Locke was introduced to the colonies by Samuel Johnson. Connecticut born, Yale bred, Johnson became first President of King's College (later Columbia) and was known for his keen intellect, broad interests, and sound scholarship. His definitive doctrine, maturing since he first got hold of Locke, appeared in *Elementa philosophica*, written in English and published by Benjamin Franklin in 1752, "the first American text in Philosophy." Its pattern is Locke, tinged with Berkeley, whom he knew personally. Fay gives its psychology, much of which is "profoundly original," a full analysis "as representing the high point of the eighteenth century in America." Particularly happy are passages on what later became the genetic, individual, social, and comparative psychologies. Unfortunately, the book, although used in King's College and Philadelphia, apparently made no ten-strike. Benjamin Franklin wrote that "'those parts that savor of what is called Berkeleyism, are not well understood here.'" The flames of traditional doctrine still burned too bright. But for 38 years Johnson had been teaching; the roots of British empiricism were slowly spreading.

The only other significant figure in this period was Jonathan Edwards, also of Locke and Berkeley, but chiefly influential because of the bomb he threw into the free-will camp. It was his psychology that helped clinch his doctrine of drastic determinism (his twofold division of consciousness into intellect and feelings, with the Will's locus in the latter), and it was largely the somewhat later psychology of the tripartite division into thinking, feeling, and willing that gave the shocked free-willists the ammunition to combat Edwards' determinism. Anyway, the problem of the freedom of the will motivated a lot of American psychology (even in William James), and it is therefore part of its history.

Next is the *Period of Intellectual Philosophy*, 1776 to 1861 (85 years). Just as the advent of John Locke in 1714 marked a turn in the road of American psychology, so did the gospel of Thomas Reid's and Dugald Stewart's Scottish philosophy after (and a bit before) the Revolution. This movement took much more quickly than that of British empiricism and led a robust life. Its "John the Baptist arrived in America in 1768 in the person of the new President of Princeton" (College of New Jersey), John Witherspoon. It "was destined to sweep everything before it," and it was another Princeton President, James McCosh, who, as late as 1886, just when our own latter-day brand of 'new' psychology was emerging, published "a two-volume work on 'Psychology,' vigorously and dogmatically affirming the basic principles of the Scottish school." Practical America could cling to the slogan 'common sense' and delight in the reinstatement of a real mind and a real physical world after British empiricism was well on the way to the elimination of both.

About half of Fay's text is given to this second (1776 to 1861) of his three periods of American psychology, and more than half of the titles of his bibliography fall within it. At its close the essentials of our psy-

chology up to James were fixed. Of more than a dozen authors, the substance of whose contributions Fay outlines, four may be singled out as developmentally significant.

Following Witherspoon as President of Princeton came Samuel Stanhope Smith, publishing in 1812 his *Lectures* given over a series of years to his classes. Witherspoon had written that "... the immaterial system (Berkeleyanism) is a wild and ridiculous attempt to unsettle the principles of common sense ... and which I verily believe, never produced conviction even on the persons who pretend to espouse it." Smith, at first a Berkeleyan, married Witherspoon's daughter, "renounced his heresies, and fell in line for the presidency"—a story that McCosh "quoted with great glee." Smith's conversion must have been pretty complete for neither Witherspoon nor the later McCosh could best his phrase, "the philosophic delirium of hypothesis." Scottish doctrine was on its way. Smith's filling-in of the philosophical pattern was more empirical than that of his European models: for the first time in American writing the nervous system was mentioned, and the role of felt motives in guiding action, the true import of prolonged infancy, the psychological significance of language and, to a point, phases of mental hygiene and individual differences were emphasized. Such slants toward application, already noted in the case of the earlier Samuel Johnson, perhaps constitute the chief differentiae of the growing American psychology. While the author does in general portray American "in the light of contemporary European psychology," he does not specifically treat this problem of differentiae.

Certainly the influence of Smith's Philadelphia contemporary, the dynamic, versatile Benjamin Rush—of both medical and philosophical renown—had the practical turn. In medicine he has been called the Sydenham of America, and his contributions to psychology are in his medical writings (ca. 1812). Like Hartley and Cabanis in Europe—but more novel over here—he emphasized mental operations as effects of previous brain-motions. He was much concerned with physical causes operative in improving man's mental faculties and in a separate volume, *Diseases of the mind*, with the correlative causes of deterioration in these faculties. Rush published the first systematic studies in the country on abnormal mentality, used in practice the technique of suggestion, often had patients write out their own account of their symptoms, named and described phobias, was interested in dual personality, and fixed the pattern for the abnormal psychologies of many later writers. Curiously enough, Frederick Beasley, made Provost of the University of Pennsylvania the year Rush died, tried stubbornly to reinstate Locke (still on top in distant Yale), but the newer movements were hard to stem.

Asa Burton, from Connecticut, having been graduated from Dartmouth in 1777, settled in Vermont as a country pastor, where he read and wrote in seclusion. Fay thinks highly of him as an independent thinker relatively untrammelled by theology. On his own he arrived at the concept of the tripartite division of consciousness, thus bolstering the psychological answer to Jonathan Edwards. For the rest, he expounded a faculty psychology (a faculty—shades of Aristotle and Aquinas—is "a preparedness in the mind for certain operations") rooted largely in Scottish theory.

Above all, many of Burton's ideas became widely spread through Thomas C. Upham, whom Burton greatly influenced. Upham started the flourishing career of that peculiarly American short cut to learning—the textbook—by publishing in 1827, about midway in our second period, *Elements of intellectual philosophy* (pp. 576). He was long-time professor of mental and moral philosophy in Bowdoin College, 1824 to 1867. The first comparable textbook in England was Sully's *Outlines*, 1884. In America, from 1827 to 1860 alone, upwards of thirty books are listed by Fay that may fairly fall under the 'textbook' heading. It became apparently no longer necessary for American students, unless forced, to read the great British authorities in the original.

Upham found the term "intellectual" too narrow for adequacy and therefore issued in 1831 his *Elements of 'mental' philosophy* (2 vols., pp. 561, 705). In 1834 appeared *A philosophical and practical treatment on the Will*, and in 1840 the first systematic textbook in America on abnormal psychology, his *Outline of imperfect and disordered mental action* (pp. 399). The textbook had voluminously arrived. Upham's second book went through eight editions from 1831 to 1869, and an abridgment thereof had five—with reprints up to at least 1881—and was still on sale in 1886. Even with no supporting evidence, these facts indicate how far-flung was Upham's influence in American academies and colleges.

Upham at first followed Locke, but turned more to Scottish and French thought. He was widely read. He himself described his work as essentially eclectic in character but wrote, after fully expounding the details of his matured psychology under the tripartite classification: "In fully exhausting, therefore, these topics, we may justly count upon having completed the exploration of the mental constitution. When we have done this, nothing remains to be said. The work is finished. The depths of the mind have been entered; the heights have been ascended; the boundaries have been set up." In England (*British Quarterly Review*, 1847) Upham's books were declared "'free from the trammels of sect and system . . . the work forms, perhaps, the most consistent specimen of the application of this (the inductive) mode of investigation to mental science in our language.'"

I have expanded a bit on Upham because Fay allots him great influence on American psychology teaching, and gives 17 pages to an exposition of his views. To only two other authors does he grant comparable space—Samuel Johnson and Asa Burton.

Fay's third period of American psychology, that of British and German influence (1861 to 1890), marks the working over of the previous systematizations in the light of fuller knowledge of what was doing in contemporary Europe—notably by Noah Porter in his substantial *Human intellect* (1868, pp. 673). Fay characterizes it as "the encyclopaedia of pre-experimental psychology, a vast compendium of the Scottish philosophy strongly influenced by contemporary German thought" (Porter had studied a year in Berlin), and Brett, in his *History of psychology*, calls attention to the fact that this 'critical compendium' flourished until well into the nineties, or later. In this period, too, British phrenology and associationism, French abnormal psychology, and German physiological psychology and psychophysics made impression in America. To the

reviewer the significant traits of pre-experimental American psychology were set in the second period, and they persisted, with variations, until James.

Fay selects, besides Porter, five authors of this final period for special mention. James Rush, in a *Brief outline of the human intellect* (1865, 2 vols., pp. 450, 480) writes, "All that man perceives, thinks, pronounces, and performs is respectively through his senses, his brain, and his muscles," and fulminates with even greater invective than Watson against 'that notional method,' metaphysics. Quite in the pattern of his British contemporary Maundsley, he elaborates his theme of mind as a physical function of the physical organism. Rush's blast, like that of his greater father at the start of the Nineteenth Century, hardly shook the prevailing philosophical psychology: Ladd's *Elements of physiological psychology* did not appear until 1887, when Dewey's *Psychology* (1886), although hailed by G. Stanley Hall as "'through and through speculative,'" was also, at least gently, tinged with the new dawn. But in the same year the old emphases were still loudly vocal in the works of two dogmatic heavy hitters. McCosh's *Psychology* blazed away from Scotland, and Borden P. Bowne, in his *Introduction to psychological theory*, tried hard to rescue psychology from encroaching physiology, "'a most estimable science, but the physiological reconstruction of psychology has been postponed.'" And yet, in spite of efforts such as these (add *inter alia* David Jayne Hill's clear and well-organized *Elements of psychology*, 1888), the science-of-the-soul psychology had by 1886 begun to fold its tents. The authoritative *Principles of psychology* by William James, in 1890, hastened its departure. Summarizing the specific chapter devoted to demonstrating the futility of the soul-concept in any scientific psychology, James wrote: "My final conclusion, then, about the substantial Soul is that it explains nothing and guarantees nothing. . . ."

The reviewer's most vivid impression on finishing Fay's informing essay was of the sharply contrasting greatness of James against the backdrop of previous figures. The scope and brilliance of his genius certainly owed little to them. His inspiration came from deeper springs. It would have been nice to learn just what, if anything, James got from them, but that would be another story. The author might, however, have included some mention of what significance James' own contributions in the seventies and eighties had for the very story that the book tells. After all, his article on the emotions appeared in 1884, which had immediate repercussions from both the 'soul' authors and those who were looking ahead, and James had been teaching 'physiological psychology' at Harvard since 1875.

In spite of Fay's cullings of the better samplings from their writings, the Americans—in comparison with European contemporaries—make dreary reading, not only for those interested merely in the current point of view of "what is called 'scientific psychology,'" but likewise for those with real empathy for the historical perspective itself. As to the reasons aside from the fact that the Europeans got there first and from the question of differences in native capacity—I feel that the prevailing 'set' of the American mind was too inimical to fresh, objective inquiry. Of the twenty-four authors apparently most significant, nineteen were

trained in divinity and served as clergymen. Of the other five, two (Benjamin and James Rush) were medically trained; one (Levi Hedge, 1816) was a logician; and two, educators, published late in the period under review—Dewey (1886) and Hill (1888). The others were primarily interested in religion and morals. Such motives promote exploitation for wishful or foregone ends, not novel exploration. One has only to name the chief Europeans whose writings initially inspired American thinkers to sense the differences in temper: Descartes, Leibnitz, Hobbes, Locke, Berkeley (divinity), Hume, Hartley, Reid (divinity), Kant, Herbart, Thomas Brown, Hamilton, James Mill, John Stuart Mill.

ROSWELL P. ANGIER.

*Los Ranchos Perkins,
Tucson, Arizona.*

SKINNER, C. E., & HARRIMAN, P. L. (Eds.) *Child psychology: child development and modern education*. New York: Macmillan, 1941. Pp. xii+522. (Collaborators: A. F. Arey, L. A. Averill, L. E. Bixler, E. A. Bond, J. W. Charles, L. D. Crow, R. M. Drake, C. Hissong, C. E. Ragsdale, G. Risdien, J. J. Smith, B. E. Tomlinson.)

This textbook on child psychology is sound, conventional, uninspired. The fourteen authors hew to the twin organismic lines of growth and progressive education. For the most part, the terminological difficulties and inconsistencies usual to a collaborative undertaking have been avoided, and the result is readable at the level for which it is designed: that of parents, students of education, and the "general reader who is not an expert in this specialty."

Chapters on heredity, physical growth, motor and language development give scientifically documented factual accounts of the growth processes, while the latter two-thirds of the book is devoted to more didactic principles of emotional guidance, mental hygiene, and character development. Learning is given a brief (18-page) chapter which, while clearly and interestingly written, includes little meat even for the intelligent layman. This is in marked contrast to the 34 pages devoted to motor development, of which 6 pages are composed of tables giving standards for development of posture, locomotion, finger prehension, fifty-yard dash, and the like. These materials are not brought to significance for the reader in any constructive way; there is no indication of how such norms may be interpreted by the teacher with any advantage except as redundant evidence of the fact that the child develops with age.

Similarly Watson's, Sherman's, and Bridges' work on emotional reactions of infants is described in some detail, while Jersild's material on children's fears and Susan Isaacs', Percival Symonds', and David Levy's work on interpersonal relations are not mentioned. It has apparently become traditional to include in all child psychology books, for whatever audience, the elaborate descriptions of age progressions of certain small units of infant behavior and the "raw material" of infant emotional response. These observations are of interest when it can be demonstrated that they illustrate principles of development that can be applied at a more mature and complicated level. Too often, however, they cannot be so integrated, and the reader is left gasping without connecting links

between the rigid science of early infancy and the didactic, apparently unsupported conclusions about guidance and training of the school child. In the present case the inclusion of the data from infant observations has taken space which might well have been devoted to further elucidation, with citation of selected experiments, of learning principles, competition, success, and failure; and more consideration could have been given to environmental factors, *e.g.* Lewin's material on autocratic and democratic societies, and description of the effect of family mores to which the child must learn to adapt.

There is much repetitive material in the volume and much generalization concerning the aims of education. One does not find, however, serious consideration of the effect of individual differences on teaching. There is a chapter on the exceptional child, which considers briefly special problems connected with the training of certain obviously atypical groups: the bright, the mentally deficient, partially seeing, hard-of-hearing, crippled, delicate, and speech-defective child. Every teacher is well aware of the special difficulties connected with dealing with these children, and even the most reactionary city school systems have by now set up special arrangements for several of these groups. This is an old and timeworn story. Alert teachers want help on problems of the more slightly deviant: reasons for, and methods of, dealing with the overactive and the apathetic, energyless child. They raise questions about masturbation, reading disability, oversensitivity. Emphasis too uniformly on the normal, regular processes of growth may obscure the fact that for teachers and parents this "whole" child with whom they must work shows a number of baffling irregular functions, some pervasive in that they influence much of his behavior and some less generalized but equally potent in interfering with standard rules of procedure. In many cases it is neither practical nor sound to dismiss such problems as merely symptomatic. Along with principles of normal growth we must have increasing attention to the problem of what makes Johnny, but not Jimmy, run.

PAULINE SNEDDEN SEARS.

Yale University.

HATHAWAY, S. R. *Physiological psychology*. New York: Appleton-Century, 1942. Pp. xxi+335.

The chief purpose of this book seems to have been the mating of neurophysiology and neuroanatomy, on the one hand, and clinical psychology, on the other. To this end, detailed discussion of the more special problems of the experimental physiological psychology pertaining to sensory and motor phenomena, as well as to learning, has been relegated to a very minor role. It was the admitted intention of the author to do so.

The divisions of the book are essentially three: the functional data of the nervous system (neurophysiology), the structural data of the nervous system (neuroanatomy), and the correlation of such data with behavior (what is usually meant by physiological psychology). This organization is somewhat flexible, however, so that there is frequent cross-reference between the three sets of data.

The inclusion of many modern neurophysiological data is to be highly commended. Much of the early part of the text is a digest of the basic electrophysiological experimentation of Gasser, Erlanger, Lorente de Nó, and their associates. These data, which must condition certain psychophysiological theorizings, have long been generally ignored by psychologists. This marks the first occasion of their full-dress appearance in a psychological textbook. Their treatment is clear and entirely adequate, although in many places Hathaway might have strengthened the significance of these data by reference to their position in psychophysiological theory. As a matter of fact, however, these vital data are rarely, if ever, referred to after their first consideration, and the reader is apparently trusted to draw the full implications for himself.

The section devoted to the structural relationships of the nervous system reverses the usual order of events, beginning at the cortical level and ending at the spinal. It is in this section that many references to behavior deviations of interest to the clinical psychologist may be made. However, no very systematic attempt seems to have been made to illustrate the salient neuroanatomical facts with detailed clinical notes.

The section devoted to the physiological correlates of behavior comprises the last 100 pages of the volume; it is composed of five chapters: "Emotions and Affective States"; "Speech"; "Intelligence"; "Consciousness and Sleep"; "Motivation and Psychosomatic Relationships." In none of these is there extensive reference to the basic material presented in the first 200 pages, nor is there concise reference to current theory which might bear upon the problems treated. Even the experimental data are more alluded to than presented.

The author has not seen fit to bolster the text with references to specific sources. With the exception of acknowledgment of the sources of six figures, no citations appear. This omission was the author's commission, for which he apologizes: "... extensive documentation has been omitted, as making for a dull and pedantic presentation." This lack of reference to original material is certain to be irritating to the advanced student who may wish to compare his own references with the author's. (It should also be irritating to the workers whose endeavors are discussed but are not cited; for example, the major part of the chapter on "Speech" is apparently based upon the labors of Weisenberg and McBride, whose names are not mentioned.) While such a procedure may save the elementary student the bother of ignoring such reference, at the same time the failure to include them gives him a false view of the methods of scientific discussion. This lack of citations is again emphasized because the Century Psychology Series has in the past included at the end of each chapter a special section for fairly detailed notes serving as an adjunct to the discussion in the text. In partial recompense, the author provides a "Selected Bibliography" of thirty-four references which will serve further to orient the student.

Physiological psychology will perhaps prove best for those students who wish to gain a casual knowledge of the field, or for those not sufficiently advanced to grasp the more difficult and comprehensive discussions of the current experimental literature.

JOHN R. KNOTT.

University of Iowa.

GOLDSTEIN, K. *Human nature in the light of psychopathology.* (The William James Lectures delivered at Harvard University, 1937-1938.) Cambridge: Harvard Univ. Press, 1940. Pp. x+258.

Goldstein's "Human nature" is a brief and highly readable account of the holistic approach to human psychopathology. Particular emphasis is given to the large body of clinical data amassed by the author throughout three decades of research.

Despite his faith in the holistic approach, Goldstein admits that "there is no doubt that the atomistic method is the only legitimate scientific procedure for gaining facts" (p. 9). His criticism of this method lies in the fact that "... in the analytic experiment, which isolates the sections as it studies them, the properties and functions of any part must be modified by their isolation from the whole of the organism." The holistic approach avoids this difficulty by emphasizing that "... we must know in what way the condition of isolation modifies the functioning, and we must take these modifications into account" (p. 10).

Considerable emphasis is given to the author's dichotomy of concrete as opposed to abstract behavior, and a wide range of illustrative material is presented, recruited largely from the behavior of brain-injured patients. Concrete behavior is "... determined directly by a stimulus. ... The individual's procedure is somewhat passive, as if it were not he who had the initiative" (pp. 59-60). Though never directly stated, there appear to be a number of criteria for abstract behavior, including the ability to form and to respond selectively to appropriate categories, to respond to imagined stimuli, to react appropriately to sudden changes in a situation, to use words as symbols, and to prepare reflectively for activity rather than to respond immediately. Goldstein flatly states that the dichotomy between abstract and concrete behavior is complete.

Whenever an organism is placed in a situation demanding a response beyond its capabilities, behavioral disintegration, "a catastrophic response," results, and this may persist even after the situation is removed. Many interesting and apt clinical examples are given illustrating this response and modes of adjustment to it.

Goldstein stresses the fact that a single motivating force is all-pervasive. He criticizes conditioned-response interpretations and internal drive theories as falling into the atomic fallacy; he substitutes for these the drive to "self-actualization": the coming to terms of the organism with its environment in the manner most complete. It is the "urge to perfection" (p. 147).

This book should be of service to a wide group of psychologists for the many useful clinical examples cited and systematically presented. Goldstein points out limitations of closely circumscribed experimental techniques and stresses the great importance of testing organisms under conditions adapted to their potentialities.

Even if one takes issue with the given concepts and with certain of the logical procedures, the contributions of this book cannot be ignored.

HARRY F. HARLOW.

University of Wisconsin.

WHITING, J. W. M. *Becoming a Kwoma: teaching and learning in a New Guinea tribe.* (With a Foreword by J. Dollard.) New Haven: Yale Univ. Press, 1941. Pp. xix+226.

The author of this volume sets himself to achieve two goals: first, to present data gathered on Kwoma culture, and, second, to present a theory of the process of socialization. In accomplishing the first aim, he gives a description of Kwoma culture patterns in the approximate order in which they impinge upon the individual from infancy to adulthood. This descriptive section of the book is not unusually full, the entire period up to adulthood being covered in 80 pages.

In preparing himself for presenting a theory of socialization, Whiting, who is primarily an anthropologist, sought further training primarily in Freudianism and in the conditioned-response theories of Hull and his associates. The reviewer thinks it unfortunate that he did not also prepare himself in the history of psychology. The essence of his theory of socialization is that the child in any society learns to do that which is rewarded and learns not to do that which is punished. There are further refinements, of course, and many of them are excellent, but the statement given above is the pith of the argument. This being the case, it seems somewhat out of proportion that in the book (as shown by the index) Hull is referred to seven times, Miller ten times, Dollard eleven times, while Thorndike is referred to only twice. All writers prior to Thorndike are passed over without any mention whatsoever. Associationists, turn!

This book will undoubtedly be read by many anthropologists. If some of them have only a slight knowledge of the history of psychology, they may arrive at the conclusion that the principle of reward and punishment was discovered at the Institute of Human Relations within the past decade. That this discovery came earlier is proven, however, by Whiting's demonstration that the Kwoma, in their rearing of children, make good use of the principles which he expounds. The Kwoma, he assures us, have not had a Western education and consequently do not base their practices upon Pavlov and his followers.

This criticism is naturally somewhat unfair. Nevertheless, it is true that what Whiting proposes as ostensibly a new theory of socialization (a big word now becoming popular) is to a large extent an application of a new set of terms to principles stated and utilized long ago. To be sure, some of the subordinate concepts are relatively new and do grow out of the work of Pavlov and Hull and of many other conditioned-response investigators as well. Since the author is writing in part for nonpsychologists, in proposing a learning theory he owes it to his readers to present them with an historical introduction to learning theory so that they can better estimate the extent of his own contributions.

WAYNE DENNIS.

Louisiana State University.

BOOKS AND MATERIALS RECEIVED

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NOTES AND NEWS

DR. RAYMOND DODGE, professor emeritus of psychology, Yale University, President of the American Psychological Association in 1916, died April 8, 1942, at Tryon, North Carolina.

DR. JAMES H. ELDER, formerly of the University of Virginia, has been appointed assistant professor of psychology at Louisiana State University. DR. ALAN D. GRINSTED, instructor in psychology, has been granted a leave of absence while on duty as an Ensign in the U. S. Navy.

DR. MILDRED B. MITCHELL, formerly psychologist on the staffs of the Independence and Mount Pleasant State Hospitals of Iowa, joined the staff of the Bureau for Psychological Services of the State of Minnesota on October 1, 1941. She is to conduct psychological studies for the Child Welfare Boards of the State, for rural public schools, and for certain private social agencies.

MR. CARL SWEDENBURG, previously on the staff of the Division of Public Institutions of Minnesota, on January 1, 1942, became full-time psychologist at the Training School for Boys, Red Wing, Minnesota, where he is to serve as Chairman of the Committee on Classification.

MR. J. LOUIS YAGER, having completed his graduate work at the University of Chicago, was appointed full-time psychologist at the State Public School at Owatonna, Minnesota, on February 1, 1942. In this capacity he will serve as Director of the Department of Research and Diagnosis.

PROFESSOR B. F. SKINNER, of the University of Minnesota, was awarded the Howard Crosby Warren Medal for outstanding psychological research, by the Society of Experimental Psychologists at its annual meeting March 30 and 31, held at the Psychiatric Institute and Hospital, New York City. The citation read: "To B. F. Skinner, University of Minnesota, for his experimental analysis of laws operating in one type of conditioning, furnishing a basis for a positivistic description of operant behavior."

A change in the EDITORSHIP of the *Journal of Parapsychology* has recently been announced. The new editors are Drs. J. B. Rhine, Charles E. Stuart, and J. G. Pratt, with Dr. J. A. Greenwood as statistical editor. The journal had been edited for three years previously by Dr. Gardner Murphy, of the College of the City of New York, and Dr. Bernard F. Riess, of Hunter College. With this change, the editorship of the journal returns to Duke University, where it was first started.

DR. S. J. BECK, head of the psychology laboratory in the department of neuropsychiatry at Michael Reese Hospital, will offer his usual summer course on THE RORSCHACH TEST IN PERSONALITY STUDY AND CLINICAL DIAGNOSIS from June 22 through June 26, 1942. The accent this year will be on the neuroses. Those interested may communicate

with the Medical Librarian, Michael Reese Hospital, 2908 Ellis Avenue, Chicago, Illinois.

THE ANNUAL MEETING of the CANADIAN PSYCHOLOGICAL ASSOCIATION will be held at the University of Toronto on May 25 and 26. Members of the American Psychological Association are invited to attend. Information about program and arrangements may be obtained from Dr. K. S. Bernhardt, Department of Psychology, University of Toronto, Toronto, Ontario.

THE department of psychology of COLUMBIA UNIVERSITY celebrated its FIFTIETH ANNIVERSARY on Alumni Day, February 12, 1942. At a reception held in the afternoon for students, alumni, and faculty, guests and friends were presented with a short history of the department prepared by Professor Woodworth and entitled: "The Columbia University Psychological Laboratory: A Fifty-Year Retrospect." A dinner for faculty, former Ph.D.'s, and students at present matriculated for the doctorate was held at the University Faculty Club in the evening. Professor A. T. Poffenberger acted as Master of Ceremonies, and brief talks were given by President Nicholas Murray Butler, Dr. James McKeen Cattell, and Professors E. L. Thorndike, R. S. Woodworth, Mark May, Alice Bryan, and Gardner Murphy.

The psychology laboratory was founded in September, 1891, by JAMES MCKEEN CATTELL, who came to Columbia from the University of Pennsylvania. At that time Columbia was located at Madison Avenue and 49th Street, and the psychology department was housed in the attic of the President's home.

THE AMERICAN PSYCHOLOGICAL ASSOCIATION COMMITTEE ON EXAMINATION QUESTIONS IN PSYCHOLOGY has recently voted to prepare a pool of approximately 1000 examination questions applicable to the elementary course, to be distributed to instructors but not to students. The Committee further voted to print a call for contributions of items in the *Psychological Bulletin*. Therefore, persons having suitable items in their possession and wishing to contribute them to such a pool are asked to send this material to the Chairman of this Committee, Dr. Edward B. Greene, 2909 Brandywine Avenue, Washington, D. C. Other members of the Committee are: Kenneth Baker (vote pending), Charles Bird, Alvin C. Eurich, Paul Farnsworth, Richard Husband, Leon A. Pennington, and Ben D. Wood.

Since the funds of the Committee are very limited, it is recommended that, wherever possible, each item should be placed upon a 5×8 card and that the cost of the work be met locally through N.Y.A. helpers or by departments. Contributors are asked to indicate: (a) whether or not they wish each item to be identified by the initials of its author; (b) what form the final work should take—booklet, cards, or microfilm; (c) how final copies should be distributed—by A.P.A. publishers, by the American Council on Education, or by private publisher.

Since it is desirable to finish the pool by September, 1942, prompt action by contributors will be appreciated.

THE AMERICAN LIBRARY ASSOCIATION created this last year the COMMITTEE ON AID TO LIBRARIES IN WAR AREAS, headed by John R. Russell, the Librarian of the University of Rochester. The Committee is faced with numerous serious problems and hopes that American scholars and scientists will be of considerable aid in the solution of one of these problems.

One of the most difficult tasks in library reconstruction after the first World War was that of completing foreign institutional sets of American scholarly, scientific, and technical periodicals. The attempt to avoid a duplication of that situation is now the concern of the Committee.

Many sets of journals will be broken by the financial inability of the institutions to renew subscriptions. As far as possible they will be completed from a stock of periodicals being purchased by the Committee. Many more will have been broken through mail difficulties and loss of shipments, while still other sets will have disappeared in the destruction of libraries. The size of the eventual demand is impossible to estimate, but requests received by the Committee already give evidence that it will be enormous.

With an imminent paper shortage attempts are being made to collect old periodicals for pulp. Fearing this possible reduction in the already limited supply of scholarly and scientific journals, the Committee hopes to enlist the cooperation of subscribers to this journal in preventing the sacrifice of this type of material to the pulp demand. It is scarcely necessary to mention the appreciation of foreign institutions and scholars for this activity.

Questions concerning the project or concerning the value of particular periodicals to the project should be directed to Wayne M. Hartwell, Executive Assistant to the Committee on Aid to Libraries in War Areas, Rush Rhees Library, University of Rochester, Rochester, New York.

THE CALIFORNIA ASSOCIATION OF APPLIED PSYCHOLOGISTS was formed at a meeting held in Los Angeles on February 28, 1942. The general purposes of the Association are to develop the science and techniques of applied psychology; to extend the utilization of the facts, principles, and procedures of scientific psychology, and to promote the services which applied psychology can render to the individual and to society. The qualifications for Fellow are: that in his present position the applicant spends the major part of his working time in the practice of psychology; that he shall have practiced psychology for a total of five years; that he shall satisfy the Board of Governors that his knowledge of psychology is adequate for sound work in the field in which he is practicing, and that it is generally extensive enough for professional standing in applied psychology; that he shall have been elected to or be eligible for membership in the AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY, the AMERICAN PSYCHOLOGICAL ASSOCIATION. The qualifications for Associate are: that in his present position the applicant spends the major part of his working time in the practice of psychology, or that he spends the major part of his time in teaching or in research in psychology, but gives one or more courses in applied psychology.

There are two branches of the Association, one for Southern California and one for Northern California, which are to hold at least bi-monthly meetings. The whole Association will meet twice a year. The officers for 1942 are HERMAN DE FREMERY (Alto Psychologic Center), President; GUY W. WADSWORTH (Southern California Gas Co.), Vice-President; SYBIL K. RICHARDSON (University Elementary School), Secretary-Treasurer.

It will be greatly appreciated if psychologists throughout the country will send NEWS of interest concerning PSYCHOLOGISTS AND PSYCHOLOGY IN THE WAR EFFORT to the Office of Psychological Personnel, National Research Council, 2101 Constitution Avenue, Washington, D. C. So far as possible these items will be published in the "Psychology and the War" section of the *Bulletin* shortly after they are received.

Psychological Bulletin

Fiftieth Anniversary Meeting
of the
American Psychological Association
As Originally Planned for Boston and Cambridge
Wednesday, Thursday, Friday, and Saturday
September 2, 3, 4, 5
1942

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Program Committee

ELMER A. CULLER, CHAIRMAN, HAROLD E. BURTT, AND THE SECRETARY

The program of scientific papers at Boston has been cancelled. The Annual Business Meeting of the Association will be held in New York City, Thursday, September 3, 1942, at 1:30 P.M. in the Hotel Pennsylvania. See next page.

ANNOUNCEMENT OF ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

On June 19, 1942, the Office of Defense Transportation of the Office of Emergency Management issued a request that meetings of various types be postponed for the duration of the war in the interest of maximum utilization of transportation and that meetings concerned with the war program be "skeletonized."

In cooperation with this request the Council of Directors of the American Psychological Association has voted to abandon the program of scientific papers, celebrations, and roundtables as planned for the Hotel Statler in Boston and for Harvard University at Cambridge. As an alternative Council has called an Annual Meeting for 1:30 P.M. on Thursday, September 3, 1942 at the Hotel Pennsylvania in New York City for the transaction of the essential business of the Association and for the development of the work already in progress for the participation of psychologists in the war effort. It is expected that this meeting will be attended by members of Council, chairmen of committees, representatives, and others in the immediate environs. Voting Members will receive an additional notice and agenda of the meeting. Associates and Members are invited to submit proposals to the Secretary for consideration at the meeting.

The Program Committee, Council, and Editor of the *Bulletin* have agreed that the Program Number should be issued as a record of the period and it is presented herewith.

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PROGRAM

GENERAL

Wednesday, September 2, 9:00 A.M.

Georgian Room

ROBERT M. YERKES, Chairman

- 9:00 A.M. HENRY A. MURRAY, Harvard University. *The Diagnosis of Personality.*
- 9:45 A.M. JOHN C. WHITEHORN, M.D., Henry Phipps Professor of Psychiatry, Johns Hopkins University. *The Psychiatric Study of Personal Relationships.*
- 10:30 A.M. CURT P. RICHTER, The Johns Hopkins Hospital. *The Biology of Drives.*
- 11:15 A.M. HERBERT H. JASPER, Montreal Neurological Institute. *Some Psychological Implications of Electrical Signs of Cerebral Function.*

EDUCATIONAL

Wednesday, September 2, 1:15 P.M.

Georgian Room

SIDNEY PRESSEY, Chairman

- 1:15 P.M. *Implications from the Psychology of Learning for Common School Practices in Evaluation.* C. ROBERT PACE, Commission on Teacher Education, American Council on Education.

An examination of commonly accepted principles regarding the conditions for effective learning compared with some of the widely used methods of measuring or evaluating the growth of students in schools reveals many inconsistencies. If one takes the position that evaluative activities should in themselves possess instructional or educative value, these contradictions between theory and practice should be removed.

From McConnell's attempt to synthesize various psychologies of learning in the forty-first yearbook (Part II) of the National Society for the Study of Education, several widely accepted characteristics of effective learning may be mentioned: (1) "The organism must be motivated to learn." (2) "Responses during the learning process are modified by

their consequences." (3) "Motivation is the direction and regulation of behavior toward a goal." (4) "Responses are selected, eliminated, organized and stabilized in terms of their relevance to the learner's goals." (5) "The fact that the goal concept . . . has been treated as a dominant aspect of motivation implies that a real goal is one which the individual wants to attain."

Evaluative practices such as the following are judged to be inconsistent with one or more of the above-mentioned principles: (1) Evaluating students with respect to goals that are not clear to them or are not accepted by them. (2) Giving tests before students are ready for them, that is, before they have developed any genuine reason for wanting to take them. (3) Giving tests the results of which are never made known to students, and from which they have no opportunity to profit.

Reference will be made to some experimental evaluative practices that have tended to promote effective learning. [15 min.]

1:35 P.M. *An Analysis of Certain Evaluative Procedures in the Light of Some Commonly Expressed Characteristics of Democratic Education.*
MAURICE E. TROYER, Commission on Teacher Education, American Council on Education.

Evaluative procedures should be examined periodically in the light of philosophical concepts commonly held by teachers and administrators. Otherwise practices developed in psychological and research divisions may operate in direct opposition to these concepts and certain basic goals of education.

Current educational literature especially emphasizes that the program of the school should, first, give each pupil a deep feeling of competence, adequacy, and security; and second, be in harmony with the principle that man should treat his neighbor as a human being of dignity and worth.

The first purpose of this paper is to examine, in the light of these two concepts, such evaluative practices as: professing a wide range of goals but appraising with respect to only a few, selecting and administering tests with little regard for individual readiness for appraisal, and interpreting individual results in the light of group norms.

The second purpose of the paper is to propose certain revisions of evaluative practices which might prove worthy of further experimentation. Reference will be made to some exploratory and experimental attempts related to the proposals. [15 min.]

1:55 P.M. *Success in College of Students from Experimental High Schools.*
NEAL E. DROUGHT, Hamilton College.

The purpose of the study was to determine the extent to which students graduating from 30 experimental high schools were successful in their performance on the college level. College success was defined in terms of nine criteria covering the areas of intellectual competence, success in college life, and success in achieving personal goals.

Almost 1,500 such graduates were studied through from one to four

years of college. This group was contrasted with an individually selected conventional school group the members of which were the same as the experimental students in age, race, sex, aptitude, achievement, socioeconomic status, community background, and interests.

The data on both groups included official college records, questionnaires, reports from instructors, interviews, and tests.

An analysis of the records of all of the experimental vs. all of the comparison students reveals that the average grades of the experimental group exceeded the comparison group average by a very slight (but statistically significant) margin. In other measures of intellectual competence as well as in the areas of college life and achieving personal goals the experimental students were almost uniformly superior by a small but consistent margin.

Since the schools differed in the extent of experimentation we varied the saturation of the experimental variable by making special analyses of graduates from (1) the six schools deviating most from the conventional pattern, (2) the six schools deviating least, and (3) the two schools judged to be the very most experimental. In each case the experimental group was contrasted with its respective comparison group.

These analyses show that among these schools, the more experimental the program, the greater the success in college of graduates. College success is clearly not a function of any specific pattern of high school units. [15 min.]

2:15 P.M. *The Use of Murray's "Need Psychology" in College Personnel Work.* HERDIS L. DEABLER, North Central College.

H. A. Murray's "Need Psychology" provides not only a framework for personality analysis that is complete and coherent in itself but one that is practical and useful as well. One of its best uses is to be found in college student personnel work where many of the problems encountered find their origin in personality conflicts. Murray's system provides a conceptual scheme for localizing and describing these conflicts. The analysis of the personality is made in terms of manifest (conscious) and latent (unconscious) needs, and methods for judging the strength of needs are presented. Techniques for dealing with conflicting need tensions are set forth. Special attention is given to the discovery of latent needs by use of the thematic apperception test and other projective devices and to the integration of these needs within the personality. [10 min.]

2:30 P.M. *Intelligence, Personality and Self-Analysis.* DANNIE J. MOFFIE, North Carolina State College.

The purpose of the study was to determine the relationship between intelligence, personality and ability to self-estimate one's interests. The Otis Self-Administering test, the Bernreuter personality inventory and the Strong Interest blank were administered to 80 N.Y.A. boys. An interest inquiry form, on which were placed occupations similar to those of the Strong, was administered to each student to check his self-estimated interests. The discrepancy between measured and estimated interest was

related to the intelligence score and the three traits, neuroticism, self-sufficiency, and dominance. Pearson coefficients were then obtained. For the six main groups of the Strong, r 's ranged from $-.170$ to $+.283$. These indicate that no significant relationships exist. It appears, therefore, that intelligence and personality are not significant factors in ability to self-estimate one's interests. [10 min.]

2:45 P.M. *A Comparative Study of the Academic Ability of Students Attending a High School in 1923 and in 1942.* F. H. FINCH, University of Illinois.

A group intelligence test was given to 651 students attending a public high school in April 1923. Nineteen years later, when the high school student body had more than doubled in size, and the percentage of all high school age youth in the community attending the school had increased materially, the same test was repeated under conditions similar to those prevailing at the time of the first examination. A comparison of the scores obtained in the earlier and more recent testings shows the changes in level of ability among the students of this school since the original tests were given. Evidence regarding such matters as population changes in the community and school policies with respect to promotion is examined to reveal the extent to which changes that were discovered may be attributed to each of these influences.

The general conclusion is that selective factors determining high school attendance have not changed in such a way as to draw the increment in high school enrollment mainly from low levels of academic ability, as is frequently assumed by educational workers. It is apparent that selective factors other than those closely associated with academic ability have operated to an important extent in determining what youth attended high school. [15 min.]

3:05 P.M. *A Follow-up Study of the Mental Development of Children in Foster Homes.* MARIE SKODAK, Flint Guidance Center, Flint, Michigan.

The mental development of 139 children placed in adoptive homes under the age of six months, has been studied by means of repeated intelligence tests. Results obtained during the preschool years have already been published. This is a report on the third series of tests given when the children ranged from $4\frac{1}{2}$ to 13 years in age.

The foster parents are above average in educational status, with a mean of 12 grades completed. The occupational level of the foster fathers is 2.8 on a seven point scale on which the mean for the general population is 4.8.

The mean education reported reached by the true-parents is 10th grade. The occupational status of the true-father is 6.4. Intelligence quotients available for 88 of the mothers range from 50 to 126 with a mean of 86. Dependency, delinquency and social inadequacy are frequent among the true-families.

The mean IQ was 116 at an average age of two years, 112 at four years

and 113 at seven years. Although large individual fluctuations continue to occur, the mean IQ for children tested at ages three through eight has shown a variation of less than three points. Children in the relatively more superior homes have higher mean IQ's than those in less superior homes.

Correlations between child's IQ and education of both true and foster parents are under .25. Correlation between child's and mother's IQ is .36 on third test. Other relationships are of similar magnitude.

This group of children whose true parents may be described as socially, occupationally and intellectually below average, but placed in above average and superior foster homes at an early age, have continued to show above average mental development through the preschool and early elementary years. [15 min., slides.]

3:25 P.M. *A Comparative Study of Braille and Talking Book Reading.*
BERTHOLD LOWENFELD, American Foundation for the Blind, New York City.

A series of test stories adapted from McCall-Crabbs "Standard Test Lessons in Reading" was given to 260 third and fourth grade pupils, another to 221 sixth and seventh grade pupils, in 12 schools for the blind. Stories for the younger group were presented in four different modes: braille, Talking Book straight reading, Talking Book with sound effects, Talking Book with dramatizations; stories for the older group only in braille and Talking Book straight reading. (Talking Books are essentially long-playing phonograph records.) Reading speed was timed and children were asked to select the stories they preferred.

The experiments reveal: (1) third and fourth grade pupils prefer Talking Book stories with sound effects and dramatizations; sixth and seventh grade pupils prefer the male voice; (2) Talking Book reading is about three times as fast as average braille reading (a detailed analysis of braille reading rate is given); (3) comprehension scores (based on the standardized G-scores) show, for third and fourth grades, Talking Book straight reading and Talking Book with sound effects significantly superior to braille reading, with greater differences in the lower IQ groups. Tests for the older group were divided into *story* and *textbook* material. For textbook material braille reading was significantly superior to Talking Book reading. For story material no significant difference is found.

Conclusions: Slowness of braille reading is generally recognized as a factor responsible for the educational retardation of blind children. The Talking Book represents a valuable supplementary reading medium in the education of the blind because of its comparatively high reading speed, its reading appeal, and its comprehensibility. Textbooks, however, should be studied in braille and the teaching of braille should not be neglected, for braille also serves as a medium for written communication. [15 min., records.]

3:45 P.M. *An Analysis of Public School Pupils' Selections of Most Important Persons.* HOWARD L. KINGSLEY, Boston University.

Data were obtained from 637 boys and girls in grades one, five, nine and twelve as to whom they considered the most important person in the world and why. Results were analyzed for sex, grade level, and values reflected in reasons given for the selections. President Roosevelt, parents, mother, and Hitler were mentioned in all grades, but with differences in frequency for the sexes and grades. Other choices show definite grade differences. First graders consider persons important for personal services rendered. Fifth graders rate as important heroes and persons of extraordinary achievement. Ninth graders value world service, superior ability and notable achievement. Twelfth grade pupils place a premium upon such qualities as skill, daring, bravery and power. Growth from self-centered values to appreciation of services to humanity and world influence is indicated. [10 min.]

BUSINESS AND INDUSTRIAL

Wednesday, September 2, 1:15 P.M.

Salle Moderne

DAEL WOLFLE, Chairman

1:15 P.M. *The Psychologist's Contribution to Industrial Morale.* H. MELTZER, Psychological Service Center, St. Louis, Missouri.

Psychologists have made many investigations which are applicable for the study of industrial morale. More recently, however, work on industrial morale done by psychologists has been limited to employer-employee interviews or to the use of questionnaires for the study of employers' attitudes. If industrial morale is comprehensively considered, any contribution that can be used to improve human relations in industry can be legitimately considered a contribution to industrial morale. From this more comprehensive point of view, job analyses set up so that key people and foremen are given opportunities to undergo a learning experience, which can be an aid in improving the understanding of relations between foremen and workers, between key people and foremen, can be advantageously used as a significant contribution to industrial morale. So also can a determination of a wage structure similarly set up. A merit rating system has more often been used in this fashion, and the application of a relevant testing program could also serve that function. All of these can be advantageously used as aids in improving channels of communication in industry and, by so doing, increase effectiveness of production as well as contribute toward the general mental health in industry. Examples from work with personnel in the machine shop as well as key people will be used to illustrate how such aids can contribute towards industrial morale. [15 min.]

1:35 P.M. *An Analysis of the Careers of 150 Executives.* DANIEL STARCH, Daniel Starch and Staff, New York City.

This study is based on the careers of 50 heads of large businesses, 50 executives at the mid-level, and 50 heads of small businesses.

Detailed records were obtained by personal interview regarding father's occupation and economic status, education and quality of school record, extra curricula activities, aim as to occupation, work and earnings during school years, first job and how secured, subsequent jobs secured, factors most important in becoming an executive, qualities executives consider essential, chief shortcomings of executives.

Among top executives, approximately three times as many went to college as in the lower level, three times as many made school records in the top third of their classes, four times as many pursued studies after their regular school years, and more than three times as many found ways to do their jobs better.

In the upper levels, 50% more began to work and earn before the age of 15 than in the lower level, two-thirds earned all or a substantial part of their school and college expenses, and two and a half times as many had records of working hard and long hours as in the lower level.

The largest difference was in the force of inner drive. In the top level, three times as many had a definite aim in life as in the lower level, and six times as many sought and were willing to assume increased responsibility.

In the judgment of executives at all levels, (1) ability to deal with people is given most frequently, namely, by 80% of executives, as essential for competent executives; (2) ability to think, to size up a situation and decide, was mentioned by 75% of the men in the top group; (3) drive courage, willingness to assume responsibility and follow through was mentioned by 55%; and (4) hard work by 32%. [15 min.]

1:55 P.M. *Predicting Success of Encyclopaedia Britannica Salesmen.* CLAUDE EDWARD THOMPSON, Northwestern University.

Twenty-one items of information on 110 salesmen were analyzed, criteria being average earnings and average number of sets sold per period. Weighting each category of a variable separately according to average standing in these criteria provided two separate score tables for age, height, weight, marital status, number dependents, thousands of insurance, years of education, number of clubs, number of offices held, years of selling experience, years on last job, reason left last job, average monthly earnings on last job, and rent or own home. Total weighted scores correlated $+ .54 \pm .05$ with sets sold and $+ .60 \pm .04$ with average earnings. Filling in the score sheets for 100 randomly selected salesmen not involved in the original data, predicting productivity, and comparing predictions with actual production, placed two-thirds of these men within one standard error of actual and one-third within three standard errors of actual production. [10 min.]

- 2:10 P.M. *Test Predictive of Success in the Occupation of Job-Setter.* ORLO L. CRISSEY, AC Spark Plug Division, General Motors Corporation, Flint, Michigan

The problem of this study is two-fold: (1) selection of tests predictive of success on a job requiring a fairly high degree of mechanical skill, and (2) analysis of the effects of modification of the criterion on the tests selected and on their predictive value.

The subjects consisted of 47 men who were given 10 paper-pencil and apparatus tests, and 70 additional men given a battery of five tests. The criterion of success consisted of the sum of the judgments of supervisors. In the follow-up analysis the raters were interviewed and given specific reference points for the evaluation of the workers with regard to mechanical skill.

In addition to using well known tests of mechanical aptitude, two tests were devised to measure unimanual and bimanual dexterity. These will be described. The Wherry-Doolittle technique, using first the ratings and then the modification of the original criterion, was used in the selection of the test batteries.

It was found that five tests were selected by each of the two analyses. The Minnesota Spatial Relations Test, Crissey Dexterity Test A and Crissey Dexterity Test B appeared in both batteries. The Minnesota Clerical Number Comparison Test and the O'Connor Tweezer Dexterity test in the first battery, were replaced by two additional procedures on the Crissey Dexterity tests in the second battery.

There was a correlation of .84 between scores on the two batteries. Both series of tests have the same predictive value as indicated by validity coefficients of .65 and .66.

Results of tests on 117 men showed a correlation of .59 between battery scores and success as measured by the modified criterion. [15 min., slides.]

- 2:30 P.M. *Interest-Values in Relation to Occupational Attitudes and Vocational Choice.* RHEA RUBISOFF, Jewish Vocational Service and Employment Center, Chicago, Illinois.

Studies employing tests of interest-values have been successful in distinguishing the basic interests of contrasting occupational groups and in groups expressing different occupational preferences.

The questions raised for investigation in the present study are: (1) Does an individual's predominant interest-value coincide with the value or values his vocational choice holds for him, as well as with the character of the vocational choice itself? (2) Do individuals, differentiated according to their predominant interest-values tend to show any consistent pattern in their appraisal of occupations in terms of the values these occupations hold for them?

Ratings on 15 occupations in terms of degree of intellectual stimulation, creative expression, social usefulness, and material success were obtained from 144 high school seniors and college freshmen at the Joliet Township Secondary Schools. Other data included Theoretical, Aesthetic,

Social, and Economic interest-values scores on the Maller-Glaser Interest-Values Inventory, and a statement of vocational choice.

Results obtained from analysis of vocational choice in relation to interest-values scores coincided with those of previous investigators. Incidental findings, not reported in the literature to any appreciable extent, will be presented.

Other results indicated: (1) Differences in appraisal of a number of occupations, namely, the commercial and high pressure occupations, by individuals with high and low interest-values scores; (2) High correlation coefficients between interest-values scores and ratings of occupations in terms of the corresponding values in only a few instances. The direction of the correlations brought out significant trends in interrelationships between interest-values; (3) A tendency to rate the occupations of engineering, medicine, and chemistry higher on some scale of value when these are expressions of vocational choice.

The significance of the major findings and their bearing on vocational guidance will be discussed. [15 min.]

2:50 P.M. *Psychological Examining of Recruits for the U. S. Marine Corps.* DWIGHT W. MILES, and WALTER L. WILKINS, U. S. Marine Corps Base, San Diego.

The organization for psychological examining and psychiatric interview of recruits at the Marine Corps Base, San Diego is described. The purpose of examination and interview is the detection of potential incompetents and mental casualties. The psychologist aids in the identification of those recruits whose general intellectual level is below that necessary for fitness for the Marine Corps, and in the determination of emotional instability, general immaturity of personality, and other conditions possibly predisposing to inadequate adjustment to military life. Reasons for rigorous rejection in the light of the objectives of the Marine Corps are outlined. Results of the administration of certain standard intelligence tests and personality inventories to various groups of recruits are presented. [10 min.]

3:05 P.M. *Limited Service Personnel in the Army: A Program of Training for Service.* MORTON A. SEIDENFELD, Personnel Procedures Section, The Adjutant General's Office.

This paper describes the program of training offered in the Special Training Units of the Army, and the tests used for placement of men in appropriate training classes, tests of achievement, soldier performance rating scales, etc., with some reference also to the methods of rehabilitation, vocational placement and individual adjustment problems as they occur in the armed services and the methods used in dealing with them.

Approximately seven per cent of the men coming into the Army give psychological evidence of either limited opportunity to secure a minimal educational background, inadequate capacity to learn, or of reduced efficiency due to some physical defect. Some of these men are capable of taking regular basic military training but more than half of them require

preliminary instruction in a Special Training Unit before they are ready to take the regular basic course.

A presentation of data covering the types of problems dealt with during a six-month period is included. The results obtained and plans indicating the scope of the program are presented. [15 min.]

MENTAL HYGIENE

Wednesday, September 2, 1:15 P.M.

Parlor A

WALTER R. MILES, Chairman

1:15 P.M. *Some Points of View Preferred by Instructors in Mental Hygiene.* NINA RIDENOUR, New York City Committee on Mental Hygiene of the State Charities Aid Association.

This paper reports part of a larger study entitled "Mental Hygiene Literature: The Preferences of Instructors in Mental Hygiene as Related to Clinical Experience." Results are based on analysis of 282 returned questionnaires, and are of interest: (1) as a technique in the indirect measurement of attitudes; (2) as a survey, showing the preferences of instructors in mental hygiene; (3) as a differential analysis of the relation between types of responses and the clinical experience of instructors.

In the questionnaire, the section on "Preferred Points of View" consisted of 16 statements in which the respondent was asked to indicate a preference on such points as the use of case histories in teaching, preferences in authors and in subjects for a lecture, the importance of psychiatric clinic training for a clinical psychologist, choice of research subjects, and the use of tests in consultation.

Each item was scored "c" for centralist or "p" for peripheralist based on Murray's concept of centralist and peripheralist tendencies as descriptive of two major divisions of psychologists. Results are described in terms of p responses or scores. Median p scores progress consistently from median of 2.3 for the group with the greatest amount of experience in clinics to a median of 6.0 for the group without clinical experience. The critical ratio for average p scores for persons in clinical work and those in academic or non-clinical work is 9.4. Differences between the clinical and the non-clinical groups in the number of extreme scores are marked. There were no reversals of direction on any item. The consistent tendency for groups with clinical experience to give peripheralist responses and for groups without clinical experience to give centralist responses is supported by several other lines of evidence in the full study. [15 min.]

1:35 P.M. *A Method of Training Clinical Psychologists for Child Guidance.* PERCIVAL M. SYMONDS, Teachers College, Columbia University.

For three years the writer has experimented with a method of training clinical psychologists for child guidance by demonstration and observation. The plan has included the use of a one-way vision room and a sound

transmitting system. A mother and child would come in during an afternoon each week for a three hour examination period, which would include a mental, physical and personality examination of the child, and at the same time a social history would be secured from the mother. The three examinations of the child could be observed by students as part of their case work training. The mental examinations would be administered, under direction, by students who had previously received instruction in these methods. Physical examinations were administered by a pediatrician. Personality examinations were administered by the instructor or an assistant. Between examinations there would be staff conferences to compare notes on observations, to suggest hypotheses, and to make proposals for treatment. Later in the year the students would secure the social histories and conduct the personality examinations while being observed through the one-way vision screen.

This method had such advantages as (1) From 30 to 40 children with their mothers would be studied during the year. This permitted the study and comparison of this number of family situations. (2) Students would have an opportunity of learning techniques in an actual clinic setting, first by observation, and later by practice under observation. (3) An opportunity was provided to gain practice in observing and interpreting behavior and to propose hypotheses concerning the etiology of the problems presented.

Following the first examination period and the tentative diagnosis reached in it, treatment or remedial work on the case which might be carried on in some instances for several months would be assigned to one or more of the students who had participated. [15 min.]

1:55 P.M. *Treatment Programs in Training Schools.* STEPHEN HABBE,
U. S. Public Health Service.

Training schools can justify themselves finally only as they rehabilitate a fair number of the delinquents entrusted to their care.

The purpose of this investigation was to determine to what extent and in what manner institutional workers, particularly mental hygienists, are carrying on treatment programs designed to prepare their youth for successful community living. Questionnaires were sent to the 160 correctional institutions listed in the last directory of the U. S. Children's Bureau.

The results of the completed questionnaires were analyzed and conclusions drawn. Representative programs are described. Emphasis is placed on activities which seem particularly useful and hopeful. The role of the psychologist in this work is given special attention. [10 min.]

2:10 P.M. *Behavior Patterns of Incurability.* GUSTAVE A. FEINGOLD,
Bulkeley High School.

Bulkeley High School is one of the few secondary schools of the country which keeps a cumulative record of pupil behavior. Negative behavior is recorded in terms of demerits accompanied by a description of the anti-social acts.

Prompted by a desire to improve the conduct of the pupils, a study of

the demerits given them by their teachers since the opening of the school in 1926 was made over a period of years. This study disclosed that approximately two per cent of the pupils in the school—mainly boys—account for more than 25 per cent of all the demerits given by the teachers. A further analysis revealed that economic depression tends to depress the spirits of high school students whatever else it may do to the adolescent outside of school. During the years of 1930–39 the average number of demerits received by pupils each year was far less than those received in the boom times of 1929 or 1940. In prosperous times high school pupils are inclined to be more insolent, more truant, to cut classes more frequently, and to disregard authority in general.

The other side of the picture—that which pertains to teachers—is equally as instructive. It was found that the same group of teachers give large numbers of demerits year after year. Men give more demerits than women, and single men far more than married men. Results of this kind are significant since they reveal the weak spots in pupil behavior, the causes of pupil-teacher maladjustments, and illustrate the need of maintaining a scientific system of pupil accounting in the secondary school. It facilitates guidance, character building, and personality development. [15 min.]

2:30 P.M. *A Comparative Study of Mental Functioning Patterns of Problem and Nonproblem Children Seven, Eight, and Nine Years of Age.*
MYRTLE LUNEAU PIGNATELLI, Bellevue Psychiatric Hospital, New York City.

The purpose of the investigation is to determine whether problem and nonproblem children seven, eight, and nine years of age differ significantly in mental functioning patterns as determined by examination with the 1916 Stanford-Binet Intelligence Test.

The children studied come from metropolitan New York, and were in most instances in attendance at school. The problem cases were under treatment at Bellevue Mental Hygiene Clinic (New York City). The nonproblem children were not behavior problems or clinical cases. Their records come from the files of the Psycho-Educational Clinic at New York University. There were 303 problem cases and a like number of nonproblem children. The number in each age division was approximately 100.

The groups were matched for median chronological age and median mental age; the median intelligence quotients were within the average range and were likewise comparable.

Stanford-Binet subsidiary tests were grouped into the following categories: language, comprehension, invention and reasoning, comparison and judgment, imagery, information, memory, perception and coordination, and number relations.

The groups were compared in terms of percentage of success in the categories. Three standard errors of the difference was taken to indicate a significant difference between groups.

No significant differences were found. There was a trend in favor of the normal children and least serious problem cases. Chances in 100 for one

group to excel another ranged from 51 to 99 with a median of 70 and a mode of 55.

Standard errors of difference in percentages of success on the categories were in most instances larger than the difference in terms of percentage between groups. [15 min.]

2:50 P.M. *The Relative Effectiveness of Three "Therapy" Procedures on the Reduction of Experimentally Induced Anxiety.* ERNEST A. HAGGARD and HENRY A. MURRAY, Harvard Psychological Clinic.

The study investigated patterns of emotional conditioning and possible differences arising as a result of whether "punishment" is self-administered at the presentation of a signal or comes without warning, and the relative effect of different methods of "therapy" on induced anxiety. The experiment consisted of three 30 minute intervals: (a) an initial conditioning session; (b) a period devoted to one of three therapy procedures: No Therapy (the subject was asked to "forget about it, and relax or walk about"), Experimental Extinction (the first session repeated without shock), and Catharsis (the subject was encouraged to discuss his reactions to the situation, ask questions, etc.); and (c) a final test to measure the effectiveness of the therapy periods in decreasing the reactions set up during the first interval.

In the first and third situations, the subject was instructed to free associate to a series of words, among which were included several associated with the shock, and at the same time to synchronize finger movements in a modified Luria apparatus with his verbal responses. Continuous records were taken of the subject's palmar skin conductance, finger responses and comments and verbal associations to the stimulus words throughout the experiment.

The analysis of variance showed that here (a) Catharsis was the most and No Therapy the least effective procedure in lowering the level of induced arousal, and (b) that recovery following self-administered shock was the more complete. Other indications of the importance of a "well-structured field" in reducing general anxiety will be noted. Also, a group of intercorrelations indicate some general patterns of reactivity which are reflected on the verbal, motor, and autonomic levels as a result of a person's being placed in the stressful situation. The above results cluster about the .05 level of significance. [15 min., slides.]

MOTIVATION

Wednesday, September 2, 1:15 P.M.

Parlor B

EDWARD C. TOLMAN, Chairman

1:15 P.M. *Development of Differential Appetite in the Rat.* LEON FESTINGER, Child Welfare Research Station, University of Iowa.

This study attempts to determine whether deprivation on a given food would result in an increased preference for that food. Ten hooded

rats were given 18 days of forced runs in a single point discrimination apparatus. Six days of free runs were interspersed in this training period. In one alley of the apparatus the animals fed for 10 seconds on one food. In the other alley they fed for a minute on a different food. The forced runs were equally divided between the two alleys.

The results of the days on which free runs were allowed show that this group of rats never ran more than 65% of the time to the place where they received a greater amount of food.

A control group run under exactly the same conditions except that the same food was present in both alleys of the apparatus quickly learn to run to the "more food" almost 100% of the time.

The difference between the control and experimental groups can be explained in terms of increased desirability of the food on which the experimental group experienced "relative deprivation."

The proportion of runs to "more food" in the experimental group can be increased significantly by increasing the hunger at the time of running. This is consistent with the above explanation.

The results of the experiment can be derived formally with the use of some of the theoretical constructs proposed by Dr. Kurt Lewin. [15 min., slides.]

1:35 P.M. *Quantitative Variation of Incentive and Performance in the White Rat.* LEO P. CRESPI, Princeton University.

This study embraces three specific inquiries under the scantily investigated systematic problem of the relationship between magnitude of incentive and performance. (1) What is the relationship between magnitude of incentive and level of performance? (2) What is the relationship between magnitude of incentive and distribution of effort within performance? (3) What are the effects of contrast variation of incentives upon performance?

To minimize learning influences a simple situation was utilized, namely, a 20' linear runway with time measurable at quarter sections.

Incentive values were fourfold increments from a unit base consisting of a 1/50th gram Purina pellet. Six levels were employed: 0, 1, 4, 16, 64, and 256 units. Drive was carefully equalized for the different incentive amount groups by feeding each rat individually up to a constant amount (depending on weight) after each daily run. The experimental design embraced analysis of variance and small sample theory.

From the results of three experiments the answers to the questions posed in this investigation are respectively: (1) a. For a cross section taken when learning changes are substantially over, a flattened sigmoid curve obtains between incentive amount measured logarithmically and level of performance (runway speed) measured arithmetically. b. A very small incentive occasions performance significantly *inferior* to no incentive at all. Qualitative observations suggest a frustration interpretation. (2) For an early block of trials, increases of incentive amount in successive groups are accompanied by progressive changes in speed-of-locomotion gradients from positively accelerated, through linear, to negatively accelerated. Implications are considered for Hull and Drew. (3) Shifting

small incentive groups to medium incentive (16 units) occasions significant "elation" effects over control performance at the medium incentive. Conversely, shifting large incentive groups to medium incentive occasions significant "depression" effects. Implications for motivation theory are offered. [15 min., slides.]

1:55 P.M. *Reward vs. Cul de Sac as Factors in Maze Discrimination.* JOHN P. SEWARD, Connecticut College.

In a previous study it was found that learning of an elevated single-T maze varied with the length of the true path but not with that of the blind. The finding bears directly on the law of effect. Since the effect of the cul may have been obscured, however, by permitting the animal to reach the food on every trial, it was decided to repeat the experiment using the non-correction method.

Three alley mazes were used with true path and blind of 3 and 3 ft., 12 and 3 ft., and 12 and 12 ft., respectively. Six groups of 12 rats each were trained, three by the correction and three by the non-correction method, to a criterion of 9 out of 10 trials without error.

The "correction" groups showed an increase in trials and errors with increase in length of either true path or blind, but the differences were not reliable. In the non-correction groups changes in the same direction were much smaller and statistically negligible. When the pooled results of the two training procedures were compared, however, reliable differences were found. The non-correction group learned in half the average number of trials and errors required by the correction group.

Two conclusions may be drawn: (1) The rate of learning a discrimination depends on the amount of difference between the alternative consequences; hence the cul de sac plays a significant role in maze learning. (2) Since, in the correction method, the inhibiting effect of the cul is more than balanced by the subsequent reinforcement, the reward appears a stronger factor than the cul. [15 min., slides.]

2:15 P.M. *The Relationship between Sexual Status and Selected Features of Behavior in Pairs of Oppositely Sexed Chimpanzees.* WILLIAM D. ORBISON and WILLIAM C. YOUNG, Yale University.

Observations were made of the relationships between sexual status and selected features of behavior such as the willingness to copulate, grooming, play, timidity in the female, indifference, directional movement with respect to the other animal, time spent together and spontaneous horizontal movement. Each of seven adult females was paired in observations made daily throughout a sexual cycle with each of three adult males. The report supplements a preliminary statement on the program of the American Society of Zoölogists, 1941.

Although individual differences were great, phase (follicular and luteal) differences were readily discernible with respect to presentation to the male and copulation. Phase differences in certain other features of behavior were less pronounced but statistically significant. During the follicular phase there was less indifference, the males groomed the females more, the female entered the cage occupied by the male more often,

the animals remained together longer, and the females displayed more spontaneous horizontal movement. No significant phase differences were found in amount of grooming by the female, play, direction of movement by the male, timidity in the female, and horizontal movement by the male.

The conclusion to be drawn from the study is that the chimpanzee with respect to the behavior observed is intermediate between lower mammals and man. To the extent that some features of behavior vary markedly with sexual status the chimpanzee approximates lower species rather than man, to the extent that other features of behavior appear to be less closely associated with sexual status the chimpanzee approximates man. [15 min., slides.]

GENERAL

Thursday, September 3, 9:00 A.M.

Georgian Room

WALTER B. PILLSBURY, Chairman

9:00 A.M. *History of the Psychological Review.* HERBERT S. LANGFELD, Princeton University.

With the January, 1943 number, the *Psychological Review* will begin its fiftieth year. At this half-century milestone it seems fitting to review the history of the publication by describing its birth and development. The chief emphasis of the paper will be upon the major contributions to the journal and their influence on modern psychology. [15 min.]

9:20 A.M. *The Law of Reciprocal Interweaving in the Morphogenesis of Behavior.* ARNOLD GESELL, Yale University.

A preliminary formulation of a Law of Reciprocal Interweaving is offered: *The functional organization of reciprocal relationships between two sets of opposed or counteracting motor systems is ontogenetically manifested by shifting ascendencies of those systems.* Normative, naturalistic, and clinical studies at The Clinic of Child Development have furnished cumulative evidence that this principle of neuro-motor organization operates to a far-reaching extent in the developmental patterning of infant behavior.

These studies include periodic observations and cinema records of prone and supine behavior, prehension, manipulation and laterality trends in a selected group of infants; also an intensive survey of the daily maturation of postures, movements and laterality in infant M.H. The latter survey was made under well standardized conditions in the infant's own home with a high degree of experimental control. Cinema data including 220 consecutive daily recordings between the 15th and 235th day of age were subjected to frame by frame analysis. Quantitative results are presented in graphs and diagrams.

These results in ontogenetic perspective show a more or less rhythmic fluctuation of dominance in counteracting components of the total action system as follows: flexors versus extensors; bilateral versus unilateral

movements; crossed lateral versus homolateral movements; shoulder girdle versus pelvic girdle; convex versus concave trunk alignment; vertical versus horizontal movement planes; symmetry versus asymmetry of motor set.

The reciprocal relationship of flexors and extensors is most fundamental and pervasive. Sherrington's law of *reciprocal innervation* describes a physiological mechanism (the inhibition of one set of muscles while the opposing muscles are in excitation is a condition for effective movement).

The proposed law of *reciprocal interweaving* describes a mode of maturation which is prerequisite for the physiological mechanism of reciprocal innervation. [15 min., slides.]

9:40 A.M. *Coöperation and Violence: Their Psychological Source and Interlacing.* GEORGE M. STRATTON, University of California.

Men are undoubtedly the greatest of all fighters. Likewise they are the greatest of all collaborators. Amicable concerted action appears to have its source in our natural endowment as individuals, quite as does quarreling. And like pugnacity, it is developed in society into an art, but an art pervading and constructive far beyond the art of fighting.

Indeed, coöperation is basic in warfare itself; no great army, navy, or air-force are possible without coöperation within each of them; nor does any of them reach its full effect without coöperation between them, and between them and the nation behind them, the nation itself impossible except as a coöperating body of men.

The development of the individual, so the evidence indicates, requires his coöperation with his fellows from childhood on; only thus does he establish vital membership in his community. Thus he also assists in creating and sustaining the community, which is the greatest stimulant and guide of coöperation among its members, and the greatest of all means against their recurring mutual violence, the greatest disrupter of their coöperation.

These and other features of coöperation suggest the general forms of curative and constructive measures in regard to crime and other kinds of domestic violence, and also in regard to international violence. [15 min.]

10:00 A.M. *Current Psychological Theory in the USSR.* G. S. RAZRAN, Queens College.

Recent Russian textbooks agree in defining psychology as the science of mental life and the concrete conscious act as its fundamental unit. A conscious act is stated to be not merely an act accompanied by consciousness but one which in its very essence is different from a non-conscious act or a mere reaction. Considerable space is allotted to sensation and perception which, after an unequivocal renunciation of Gestalttheorie, are held to be separate and distinct functions. Intelligence testing is severely criticized as a fatalistic philosophy of static norms ignorant of and detached from the dynamics of mental development. Quantitative methods in psychotechnology are encouraged but leanings toward qualitative

approaches of personality are clearly evident. Psychoanalysis is, however, either ignored or disdained. Will, imagination, and thinking are treated at length, the material being often of a historical rather than of an experimental character, as psychology itself is often said to be a bio-historical discipline. All these trends are in marked contrast to psychological theory in the USSR in the twenties and early thirties when psychology was regarded as the science of reflexes (reflexology of Bekhterev), of behavior (Blonski and others), or of reactions (Kornilov). The change is partly due to the publications of the Lenin philosophical notebook in 1933 and the resolutions of the CPCPSU on pedagogical distortions in 1936, but partly also due to the fact that pure behavioristic psychology proved unwieldy and unworkable in the concrete situations with which the Soviet psychologists have been confronted in recent years. In all, current Soviet psychology may probably be best designated as a sort of Neo-Functionalism, although Soviet psychologists will no doubt resent such an appellation. [15 min.]

10:20 A.M. *Revolution in Psychology Number Three; Cortex to Hypothalamus.* EDWIN D. STARBUCK, University of Southern California.

No student of historical movements takes revolutions too seriously. There are, doubtless, definitely marked transitions. It would seem to me no idle fancy to claim that during the last three quarters of a century there have been three pretty definite reconstructions of perspective and restatement of the tasks of psychology.

The first revolution: the birth of a truly scientific psychology, was away from philosophizing *about* the mental life, to the study *at first hand*, empirically, objectively under controlled conditions, aided by experimental techniques, of its nature and its possible improvements. The names of great leaders flock to our minds,—Weber, Fechner, Wundt,—soon their name was legion.

The second revolution: towards an organismic view of mentality after the measuring, dissecting, analyzing had tended to result in a mechanistic view of life and an atomistic conception of nature. Among the techniques for restoring life's wholeness were these: the restoration of the older doctrines of the will; the invention of genes, ids, and other fanciful concepts; the playing up of countless numbers of types of urges and drives; the conjuring with instinct and instincts and many other devices that developed feeling that life is basically urgent, dynamic, and dramatic.

Revolution number three: cortex to hypothalamus. "The hypothalamus," in the words of Foster Kennedy, "is the neuroglandular instrument of vital rhythm." It not only regulates but controls essentially all the basic metabolisms. It has within its keeping "The Wisdom of the Body." The cortex is not seat and center of wisdom. It is like the hands, a sort of prehensile and adaptive mechanism at the service of this deeper lying center of valuation, the hypothalamus. It is the center of gravity of a progressively integrating personality.

This third revolution will radically influence education and training and personal attitudes towards life. [15 min.]

10:40 A.M. *Blackfoot and Western European Cosmology in its Relation to Control of the World.* L. M. HANKS, JR., University of Illinois.

We oppose the thesis that preliterate societies are fearful in their ignorance before an unintelligible world by maintaining that preliterates develop concepts and techniques usually adequate to exercise a satisfactory degree of control of the world.

The Blackfoot world is arbitrarily divided into three categories: (1) parts of the world over which there is direct manipulable control; e.g., breaking a horse; (2) those parts of the world over which control is indirect through human specialists or intervention by a supernatural power at the plea of the individual; e.g. breaking chains with one's hands; (3) those parts of the world over which there is no control; e.g. a diminishing buffalo supply.

The Blackfoot concept of cosmos is then compared for control with the Western European concept. Though the latter includes events that are non-existent to the Blackfoot, the two are in fair agreement on those parts of the world that are directly manipulable and that are uncontrollable. But not on those points that are indirectly controllable. We distinguish the following categories of indirectly controllable events: (1) events that are controlled indirectly by both worlds, though the means of control differ, e.g. certain kinds of sicknesses; (2) events considered uncontrollable in Western European culture over which Blackfoot exercise indirect control; e.g. the weather; (3) events considered uncontrollable by the Blackfoot over which the Western Europeans exercise indirect control; e.g. small pox. The events in these categories are usually deemed non-existent by people of another culture, or the reality of the means of control is doubted. We conclude that in terms of the Blackfoot, little fear exists because they have developed concepts and implements for the control of the cosmos as they perceive it. [15 min., slides.]

11:00 A.M. *Man's Most Creative Years: Then and Now.* HARVEY C. LEHMAN, Ohio University.

It has been suggested that, whereas, in former centuries significant scientific contributions could be made often by youthful investigators who possessed relatively meagre knowledge and background, today it may perhaps be necessary for the potential contributor to possess more extensive experience and a larger fund of knowledge if he is to make contributions of outstanding importance.

As a means of investigating possible age changes that may have been occurring within recent years, the writer compared the ages at which 84 geological contributions were made by 63 geologists born prior to 1800 with the ages at which 99 contributions were made by 65 geologists who were born from 1801 to 1857 inclusive. The data for 14 other groups of creative thinkers were partitioned in similar manner and age-curves were constructed for each of the sub-groups. For physics, geology, invention, mathematics, pathology, classical descriptions of disease, medicine and public hygiene, "best books," economics and political science, education, and philosophy, the more recently-born contributors were found to have accomplished their most creative work at somewhat younger age levels

than was found for the contributors that were born in earlier centuries. For chemistry, oil paintings, and astronomy, no significant age change was evident.

On the whole, there seems to be no factual basis for supposing that the most important creative work of the present day is being done by individuals who are older than the contributors of past centuries have been. If any genuine age change is taking place, the change seems to favor the younger rather than the older age-groups. The foregoing statements do not hold for quantity of output but only for creative work of the highest merit. [15 min., slides.]

11:20 A.M. *Operational Definitions in Social Psychology and the Social Sciences.* ARTHUR JENNESS, University of Nebraska.

The use of operational definitions is pedagogically sound; requiring a person to repeat an operation provides more stimulation than does definition. Operational definition is said to be regression to gesture language, which lacks syntax and is ineffective in communicating abstractions and generalizations. If the syntax of gestural communications is limited, operational definitions obviate some syntactical problems. The Gelb-Goldstein-Weigl-Scheerer Sorting Test requires persons to define concepts operationally; it demonstrates that abstractions can be communicated by performances.

Social psychologists have been slower than some social scientists of offer operational definitions, though Weiss proposed such definitions in social psychology before Bridgman's work was published. Operational definitions may eliminate some of the confusion arising from indiscriminate use of concepts and data drawn from anthropology, sociology and psychology in recent textbooks on social psychology.

Some "operational" sociologists claim that the group is an organism which can be studied by the same techniques used in studying individuals; they have disregarded operational criteria for discriminating groups from organisms. They maintain that their definitions are operational if they specify the mathematical procedures they have employed. Mathematical operations define only mathematical concepts. Mathematical procedures yield numbers, which are "meaningless" unless referred to other concepts which are operationally defined.

One hope for "integrating" the social sciences lies in examining the research techniques of various social scientists. When these are examined, it appears that social scientists have more in common than they realize; at least, many of their operations are common to them all. Examples will be given of (1) operational definitions in social psychology, (2) instances in which equivalent operations yield different verbalizations in several social sciences. [15 min.]

AMERICAN PUBLIC OPINION TODAY

Program Arranged by the Program Committee of the Society
for the Psychological Study of Social Issues

Thursday, September 3, 9:00 A.M.

Salle Moderne

GOODWIN B. WATSON, Chairman

9:00 A.M. *Some Relationships among Attitudes Pertaining to the War.*
ARTHUR W. KORNHAUSER, University of Chicago.

Interviews were conducted with a sample of several hundred Chicago adults to ascertain their attitudes on a variety of questions pertaining to the war. A short-answer question form was used with half the persons, a free-answer type of question with the other half. Information was also recorded concerning sex, age, race, nationality, religion, marital status, schooling, occupation, income class, presidential vote in 1940, and daily papers read. A number of the attitudes expressed on each form are analyzed in relation to one another and in relation to the personal data. Interpretations suggested by these interrelations will be discussed. The two types of question-form are also compared with respect to their usefulness in the attitude survey. [10 min.]

9:15 A.M. *Gauging the Nation's Morale.* JOHN HARDING and HADLEY
CANTRIL, Office of Public Opinion Research, Princeton University.

A method devised by the Office of Public Opinion Research for measuring morale on a nation-wide basis will be described. The rationale behind the surveys and the technique used for analysis of the data will be discussed. [10 min.]

9:30 A.M. *A Profile Measure of Morale.* M. ERIK WRIGHT, Ohio State
University.

Working on the hypothesis that morale is a multi-dimensional concept and can not be adequately expressed by a single score value, The Morale Committee of the Department of Psychology of the Ohio State University is developing a technique of profile representation of an individual's morale status. On the basis of previous research, and also on the basis of an analysis of current reports, such components of morale as confidence in leadership, enthusiasm for the cause, willingness to sacrifice, time-perspective, feeling of unity, etc., were included in the profile.

A questionnaire consisting of 100 items, based on these various components, was formulated. These questionnaires are being individually administered via student interviewers, who have been given a brief training in interview techniques. A plan for repeated samplings of opinion-reaction to this questionnaire in the various regions is being developed. [10 min.]

9:45 A.M. *Case Studies of Attitudes Toward the War and Peace.* S. S. SARGENT, Barnard College, Columbia University.

How have individual attitudes toward the war changed since 1938? What made some people isolationist and others interventionist during the period of American neutrality? What kind of people are enthusiastic in their support of the war today, what kind are lukewarm, and what kind, if any, oppose it?

To obtain answers to these and similar questions case studies were made of several dozen representative adults residing in a rather typical agricultural county in the midwest. Each person was interviewed one or more times and was asked a number of questions, roughly divided into three areas: (1) Personal data. (Occupation, schooling, newspapers and magazines read, organizational affiliations, etc.) (2) Attitudes at certain crucial periods. (At the time of the Munich settlement, at the start of the war, when France fell, when Russia was invaded, when Pearl Harbor was bombed, when Singapore fell.) (3) Morale. (General attitude toward our war effort, confidence in our leaders, understanding of war aims, confidence in the accuracy and adequacy of news reports, attitude toward our allies, assurance of military victory by the United Nations, hope of lasting peace following the war.)

Interviewees were also encouraged to express their attitudes qualitatively.

Though in no sense a cross-section of American public opinion, the results reveal significant attitudinal differences and throw light upon their causes and correlates. [15 min.]

10:05 A.M. *The Global Consciousness of the American People.* DANIEL KATZ, Office of Public Opinion Research, Princeton University.

Any practical discussion of post-war reconstruction should take into account the psychological readiness of the people for broad programs of world reorganization. The public opinion polls are furnishing one source of data concerning the global consciousness of the American people. Analysis of these data supply at least partial answers to three types of questions. (1) What are the most common attitudes toward American participation in the post-war world? How much agreement is there about the general goals of a post-war policy? Is there any thinking among the people about the instrumentation to achieve these goals? (2) What are the background correlates of particular attitudes such as post-war isolationism, Anglo-American domination, and internationalism? Are the supporters of a particular doctrine found more frequently in one income group than in another, in one age group, one religious group, or one nationality group? (3) What are the attitudinal correlates of opinions concerning post-war policy? Are the internationally-minded people also those who are more willing to listen to peace offers under certain conditions? Are they more inclined to place the guilt for the war on the German people rather than the German government? Are they more or less pro-labor, more or less fearful of Russian communism than their fellows? [15 min.]

10:35 A.M. *Impact of War on a Nationalistic Frame of Reference.* C. E. OSGOOD, Yale University.

Between February 1940 and March 1942, selected groups of college men have been sampled 8 times and random adult groups three times, to obtain evidence relating to the impact of war on attitude structures. Two forms have been used, one relating to people (Russians, Socialists, Pacifists, etc.) and one to policies (Neutrality, Fighting, 100% Americanism, etc.) In both forms reactions are made on a 7-point gradient the ends of which are defined by positive and negative adjectives (kind-cruel, valuable-worthless, strong-weak).

Two types of analysis will be presented. First, intercorrelations of individual reactions have been computed (college students only) to reveal the presence of patterns in thinking and to give an operational definition of a "frame of reference." Second, median ratings given by the various groups of people for total approval of the attitude objects and for qualitative differences on specific items will be presented. (For example: total approval of Frenchmen declined rapidly during the winter and spring of 1940-41.)

Trends in the data will also be presented with respect to variability of judgments (increase of uniformity in recent months) and changes in patterning (e.g., the changing place of Russians in the frame of reference).

Adult data are compared with those for college subjects, and evidence bearing on stereotyping, polarization and other processes influenced by the war situation will be presented. Significant differences related to age, sex, education and politics are found on several variables. [15 min.]

10:55 A.M. *Peace Plans: Popular Reactions to a Scientific Program.* ROSS STAGNER, Dartmouth College.

If social psychologists have any basis for their claim that their discipline is fundamental to the sciences of human interaction, they should be able to make a significant contribution to the planning of a durable peace. It seems plausible that the failure of the Versailles settlement was primarily psychological. Can psychologists contribute anything toward preventing a repetition of this catastrophe?

It is held that the principles of reward and punishment apply to the behavior of individuals in groups, as much as to their behavior in isolation. Durable peace involves rewarding forms of behavior which tend to keep the peace, and punishing those which increase international friction. Punishment of such actions, however, is not the same thing as revenge (cf. penology).

Keeping the peace will also depend upon effective coöperation on an international scale, first for the allied victorious peoples, and ultimately for all nations. The prospects of coöperation in the immediate future will be a function particularly of attitudes toward Russia and China.

A program was drawn up which was believed to cover the main psychological prerequisites for a durable peace. These were reduced to specific items which could be checked as in a public opinion poll. Early returns from psychologists and others who might be considered as validating judges indicate that the program was correctly prepared.

The same opinion issues have been presented to several hundred adults in different parts of the United States. The results will be analyzed to show the relation between the revenge attitude and hostility toward Russia, the specific "areas" of public opinion in which education is urgently needed on certain topics, and the prospect that a majority of the American public will accept a scientifically planned peace program. [15 min.]

PSYCHOMETRICS

Program Arranged by the Program Committee of the Psychometric Society

Thursday, September 3, 9:00 A.M.

Ball Room Assembly

PAUL HORST, Chairman

9:00 A.M. *A Factor Analytical Approach to Job Families.* CLYDE H. COOMBS, The Adjutant General's Office.

A number of representative occupations were selected from job analysis schedules made available by the USES. The schedules on these occupations were then studied for the purpose of making a listing of the job elements characterizing each occupation. If an element were present in a job, it was given a weighting of one or two depending on the degree of skill, effort, or intensity with which that element entered into job performance. The element was also given a loading from one to three to indicate the relative proportion of that element in the total occupation. The product of the weight and the loading was then taken as the degree to which the job element characterized the job.

The intercorrelations of the type occupations were obtained on the basis of the number of common elements. A group of 20 of the jobs so analyzed have been selected for a preliminary factor analysis. M. W. Richardson of the Adjutant General's Office collaborated in the study. [10 min.]

9:15 A.M. *Experimental and Factorial Study of Perceptual Dynamics.* L. L. THURSTONE, University of Chicago. (By Invitation)

Several hundred subjects were given forty individual laboratory tests of perception. The tests included the following groups: Alternation effects, with the Necker Cube, the Windmill Illusion, Retinal rivalry reversals, and Schmidt apparent movement test; Closure, represented by the Gottschaldt Figures, Hidden Pictures, Kohs Blocks, the Street test, and several others; Reaction time, Perception time, and Judgment time in a number of tests; five optical illusions; several tests of color-form differentiation; several tests of constancy; and several tests of visual-motor coordination. A factor analysis indicates the existence of several distinct functional unities. One of the most prominent factors seems to involve the strength of a configuration associated with the perception of form. Another factor seems to involve the imaginal control of a configuration. It might be described as resistance to Gestaltbindung, flexibility in

manipulating a configuration, or the ability to shake off a set and take a new one. In addition to these two factors, others were found representing reversal effects, optical illusions, reaction time, speed of perception, speed of judgment. So far the factors are given only tentative interpretation, subject to repeated experiments. [25 min., slides.]

9:45 A.M. *Determination of Relative Amounts of Punishment in Learning.*
DONALD A. PETERSON, University of Chicago.

In a learning experiment with rats, two types of jumping apparatus were used: (1) The Lashley apparatus, in which the rat jumps at a stimulus card; if the rat makes an error, it bumps against a locked door and falls into a net below; (2) a modified jumping apparatus in which the rat jumps to a platform in front of a stimulus door and if it is the locked door, the rat corrects the error by running around on a short elevated path to the jumping stand for another attempt. Judged by conventional standards, the first apparatus mentioned (Lashley) gives the rat more punishment per error than does the second apparatus. If this is true, it should be possible to determine these differences in the learning records of the subjects by the use of appropriate methods of analysis of data. A rational mathematical equation developed by Professor Harold O. Gulliksen with parameters for the effect of punishment and reward offered an approach to the problem. An analysis of the individual learning records was made using two special cases of the above mentioned general learning equation. The results, using this technique, indicate that differences between the learning records for the two pieces of apparatus are in the direction to be expected according to conventional standards of punishment (i.e. more punishment per error on the Lashley apparatus). This is a preliminary study and suggests that more extensive work using more precisely defined degrees of punishment might be profitable when treated by rational mathematical methods. [15 min., slides]

10:05 A.M. *The Relation of Psycho-physics and Mental Test Theory.*
M. W. RICHARDSON, The Adjutant General's Office. (By Invitation) [25 min.]

10:35 A.M. *The Factorial Isolation of the Primary Auditory Abilities.*
J. E. KARLIN, University of Chicago.

Psycho-physiological work, based on the physics of sound waves, has experimentally defined a large number of auditory functions. The purpose of this factorial study was to attempt to indicate something of the nature of the relationship between these functions and to evaluate empirically the evidence for their independent functional existence.

Twenty-seven auditory tests were adopted or constructed to cover the conventional factors of pitch, loudness, timbre, time, rhythm, masking, distortion, and memory. In addition, four visual memory tests, an intelligence test, and chronological age were used as variables. Analysis of the inter-correlations yielded eight interpretable factors.

All these factors differed in varying degrees from the conventional factors current in auditory literature, as follows: A Frequency-integration

factor, underlying both pitch and timbre processes; a Loudness factor, defined operationally as a perceptual parameter; an Auditory Integral factor, involving active judgment of primitive auditory mass; an Auditory Resistance factor, calling for the differential repression of incidental sound forms tending to obscure relevant sound forms; a Speed of Closure factor, transcending sense modality; a General Span factor, apparently the central process in span tests of different sense modalities; two further Memory factors. In particular, the Auditory Integral and Auditory Resistance factors are apparently reported for the first time.

The application of factorial methods to auditory phenomena which are experimentally well-known appears to allow of a preciseness and generality of interpretation of fundamental primary factors not often possible with primary cognitive abilities. Conversely, experimental findings on disparate auditory functions achieve greater meaningfulness when their common nature is disclosed. Factorial relations in the auditory field disclose basic psychological and physiological processes not readily obtainable from a consideration of the properties of the physics of sounds. Clinical tests in auditory pathology are also discussed with reference to the primary auditory competencies. [15 min.]

10:55 A.M. *The Fields to Which Factor Analysis Applies.* TRUMAN L. KELLEY, Harvard University.

Factor analysis as a method is a mathematical concept. Like all such there are certain antecedent axioms, postulates and assumptions which must be accepted. When accepted then the mathematical development reveals certain consequences or relationships. If the justification for the procedure does not extend beyond this there is no slightest assurance that the consequences have the slightest bearing upon reality.

When the question of the reality of findings is raised a careful and detailed scrutiny of the field involved is necessary. The field must exist in reality and it demonstrably must be such as to strongly suggest the fitness of the assumptions which are basic to the theory.

From this approach the question is raised as to whether factor analysis is adaptable to fields of economics, sociology, business, physical and biological sciences or whether it is congruent only with psychology where (excepting of course the field of pure mathematics) alone it has functioned. [15 min.]

11:15 A.M. *Psychometrics in the Army.* HARRY W. BUES, Captain, A.G.D., and THOMAS W. HARRELL, 1st Lt., A.G.D., Personnel Procedures Section, The Adjutant General's Office. (By Invitation)

Psychometric procedures in the Army are used in Recruit Reception Centers, by Local Examining Boards for Aviation Cadet Applicants, at Replacement Training Centers, in Divisions and other tactical units. These methods are developed in the Personnel Procedures Section of The Adjutant General's Office, in the Classification Division of the Air Corps Technical Training Command for aviation mechanics and other main-

tenance men, and in the Psychological Division of the Air Surgeon's Office for airplane pilots and the other members of the air crew.

The personnel using psychometric methods are in almost all instances officers or enlisted men. Exceptions are civilian personnel technicians in ground crew replacement training centers. The extent to which members and associates of the American Psychological Association are engaged in various phases of military personnel will be reviewed. Enlisted men are being trained to be classification officers at the Adjutant General's School. Two courses, one for Personnel Consultants, and the other for Personnel Technicians, are of especial interest to psychologists. The teachers, in addition to the AG school faculty, are recruited from the National Research Council's Committee on the Classification of Military Personnel, advisory to the Adjutant General's Office, the staff of the Personnel Procedures Section, and other personnel specialists in Washington.

The activities of the Personnel Procedures Section will be summarized. The question of how they developed and function to improve Army Personnel Classification, will be considered. Among these procedures and the instruments used are: the initial classification techniques used in the thirty-seven Recruit Reception Centers such as the classification interview, a General Classification Test (Four Forms) and a General Mechanical Aptitude Test (Three Forms), Oral Trade Tests; individual tests used to aid in classification of special problem cases; special tests for truck drivers, radio operators, automobile repairmen, electricians, installer-repairmen, and tests for combat intelligence personnel; rating scales, Clerical Aptitude and Non-Language Tests. The most widely used of these psychometric techniques is the General Classification Test. It is composed of verbal, numerical and spatial items arranged in cycle omnibus.

The validity of aptitude tests for predicting training records of Airplane Mechanics and Weather Observers has been reported by Faubion and colleagues. In addition to those two courses, the Classification Division, Air Corps Technical Training Command is concerned with picking students for other courses in the Air Corps Technical Schools.

A paper and pencil personality test has been studied but its validity in picking out guard cases and men in the neuro-psychiatric ward has not been sufficient to justify its use. Interest inventories also have been tried. One may be used as an aid for selecting technical instructors. As a rule however, the interview and questionnaire are used in determining interests or preferences.

Recently, emphasis has been placed on the selection and classification of Officers. An Officer's Qualification Card, similar to the one for Enlisted Men, has been instituted. Studies of the mental and personality traits contributing to the success of men in officer training will be described. [25 min.]

MEASURES OF PERSONALITY

Thursday, September 3, 9:00 A.M.

Parlor A

MARK A. MAY, Chairman

9:00 A.M. "*Graphometry*": *A New Diagnostic Method*. WERNER WOLFF, Vassar College.

A relationship between expressive movement and personality was studied, with graphic movements considered as a projection of expressive movement upon paper. A consistency of the same graphic pattern under different conditions of writing would, it was thought, indicate that graphic forms are not a product of chance, but rather of inner-personal determinants.

Twenty subjects were required to draw in three sessions at three day intervals a set of six simple geometrical forms with eyes closed using their right hand, then their left, and both procedures repeated with eyes open. In the third session consistencies of forms defined in terms of their length were demonstrated to the subject who then was asked to repeat the whole series with the instruction to break down these patterns.

In spite of the different and unaccustomed conditions an average proportion of forms remained consistent in 50% of the cases in session I and II, and in 59% in session III, where consistency appeared regardless of deliberate attempts to alter it.

Data suggesting consistencies of graphic movements throughout life were found in the measurement of signatures of about 100 famous people at various stages of their lives and in drawings of preschool-children, indicating that a unit and organization of movement seems to exist independent of training.

The consistency of proportions in graphic movements suggests diagnostic application of Graphometry. Selecting documented signatures made in a state of elation and of depression there was found a regular increase of proportions in elation, a decrease in depression, a fluctuation which does not appear in a normal state of mind, suggesting a relationship between graphic movement, its proportions, its degree of consistency and personality. Forgeries may be detected by measurements.

Cases discussed will be illustrated by projections. [15 min., slides.]

9:20 A.M. *An Experimental Study of the Relationship of Frustration Reaction, Ego-Defense, and Hypnotizability*. SEYMOUR SARASON and SAUL ROSENZWEIG, Clark University.

The purpose of this study was to investigate Rosenzweig's triadic hypothesis that hypnotizability as a personality trait is to be found in positive association with repression as a mechanism of ego-defense and impunitiveness as an immediate reaction to frustration. A projective test was constructed for evaluating frustration reactions as extrapunitive, intropunitive, and impunitive. Repression was estimated from the recall of a set of 15 jig-saw picture puzzles, on half of which the subject had

been deliberately failed, on the other half of which he had been allowed to succeed. The recall was asked for several minutes after the administration of the last puzzle. Hypnotizability was measured by a standard technique developed at the Harvard Psychological Clinic. A short form of the Thematic Apperception Test was used as a means of gauging the subject's reactions to the hypnosis. Twenty college students comprised the chief experimental group.

A correlation of .54 was found between repression and impunitiveness, .66 between repression and hypnotizability, and .78 between impunitiveness and hypnotizability. When those subjects who did not show mnemonic repressions but recalled instead a preponderance of failed puzzles were compared with those who did show repression, it was found that the former were significantly more extrapunitive and less hypnotizable. These results tend to corroborate the triadic hypothesis. [15 min.]

9:40 A.M. *Level of Aspiration as Ego Defense.* ROBERT R. HOLT, Harvard Psychological Clinic.

The hypothesis was advanced that levels of aspiration are to be interpreted in terms of defense by the Ego of its self esteem, and thus can be fully understood only by exhaustive study of a few cases.

Accordingly, the subjects who were studied intensively by the other experimenters at the Clinic were given two sessions of tests, purportedly of Mental Efficiency and of Mechanical Ability. Previously, and for another experimenter, they had rated themselves on these among a number of other abilities, ranking them in order of personal importance. Before starting the session, they were asked to rate themselves on the ability to be tested, and before each particular test, the subjects predicted their performance on it as a whole. After the first three of the 13 trials of each test, which were scored in every case close to the average, the subjects predicted the best and worst scores they expected to get during the remaining trials. Again, after five more trials, of "success," "failure," or "variable" performance, similar predictions were made. Each subject experienced each of these conditions in each session. Scores were reported after every trial in terms of percentile standing. This elicited vivid success and failure experiences in the subjects. Finally, the subjects were asked which had been the best test of the tested ability, invited to comment on the tests and to explain their failure. A week later, they re-rated themselves on the abilities for another experimenter, re-ranking them in terms of personal importance.

Consistent patterns of defense were established in terms of discrepancies between predictions and performances, shifts in estimates of ability, ranges of aspiration, and shifts in "personal importance" of abilities. These patterns were validated by the case studies. Results are discussed in terms of the meaning of the level of aspiration to the total personality. [15 min.]

10:00 A.M. *Sociometric Measurement of Personality.* HELEN HALL JENNINGS, Teachers College, Columbia University.

The research examines the same individual's behavior in choice and rejection of others at two points in time eight months distant and further

investigates personality- and non-personality-factors which might bear upon this problem. The subjects were the population of the New York State Training School for Girls. The procedure consisted in sociometric testing and re-testing based on unlimited expression of choice and rejection on all criteria for association in the community; in addition, social contact test results were secured.

Emotional expansiveness, as measured by the extent of positive choice expressed for other persons, shows only a small correlation with social expansiveness, as measured by the extent of the individual's social contact range. The relationship is somewhat greater between the individual's social expansiveness and the extent of positive choice expressed towards him, but after an interim of eight months no correlation appears. Social expansiveness appears related to length of residence and to intelligence but emotional expansiveness shows no correlation with these variables.

The individual is found to exercise choice and rejection independently of the manner in which the situation in which he is structured in respect to him; individuals in isolated (unchosen) or in leader (over-chosen) positions show choice behavior characteristic for them as individuals. The individual is found to vary from time to time only *within a range* of expression typical for him, his "repertoire" for reacting by choice or rejection towards others.

Certain behavior characteristics differentiate between different positions of choice-status; impersonal factors, as length of residence, chronological age, etc., do not.

Both isolation and leadership appear as phenomena which arise out of individual differences in inter-personal capacity for participation with others, differences which are revealed when the personalities of isolates and leaders are studied. [15 min.]

10:20 A.M. *Ratings of Personality Traits in a Clinical Situation as Indices of School Adjustment.* MAX DEUTSCHER, Yale University.

This study attempted to determine the reliability with which observations of test behavior might be made and their significance for the prediction of specific kinds of behavior in the classroom and as indices of adjustment to the social standards of the classroom.

A survey of the literature and a questionnaire survey of practice yielded items recommended by test standardizers for clinicians to observe and the observations which practicing clinicians made. Twenty-seven scales for the observation of behavior were assembled from these sources and used in a typical clinical situation.

The group used for the experiment consisted of 100 eighth grade boys ranging from borderline to superior intelligence. Information was available on their behavior during the school day and their adjustment in the classroom.

The Haggerty-Olson-Wickman Behavior Rating Schedule was used in securing the criteria for behavior and adjustment. They were obtained from three teachers' rating on this schedule. The reliability of these ratings was .79.

The reliability of each of the twenty-seven clinical scales was deter-

mined by means of the correlation of observations of an independent observer and the examiner. Reliability coefficients ranged from .33 to .89 with a mean at .65 in a group of boys.

The significance of the observations for the prediction of specific kinds of behavior in the classroom was shown to be low. Sixteen items showed significant coefficients. The behavior in the area of intraversion-extraversion proved to be most predictable. Mood was predicted best of all areas.

These observations proved to predict adjustment in the classroom significantly. Eighteen items were significant for this prediction. Each item was assigned a score in proportion to its demonstrated prediction of adjustment. These scores, summed and correlated with the criterion score, gave a coefficient of .72; corrected for attenuation it became .89. [15 min.]

10:40 A.M. *The Relation Between Physique and Measures of Intelligence, Temperament, and Personality in Superior Adolescent Boys.* DONALD W. FISKE, Harvard Psychological Clinic.

Using preparatory school boys as subjects ($N=91$ to 182), relations were sought between various psychological measures and body build (as measured by Sheldon's somatotyping technique). The subjects were grouped on the basis of physique (somatotype), consideration being given both to strength in each of Sheldon's primary components of physique and to pattern of component dominance. The analysis of variance was employed to test whether each variable was related to somatotype group.

Intelligence was measured by three group tests (Modified Alpha, ACE Psychological Examination, and a vocabulary test), one test of creative intellectual functioning, and scholastic achievement. Motor performance was measured by motor speed, accuracy, and point pressure on the Detroit Motor Speed and Precision Test. Handwriting samples were also used. None of these measures was significantly associated with somatotype group.

The number of significant findings on variables from a rating scale, from the Bernreuter Personality Inventory, and from a specially devised ink-blot test was negligible. On an interest questionnaire, however, several items were related to somatotype group; many of these can be explained in terms of the fitness of particular physiques for certain activities.

Supplementary measures, including electroencephalograms, basal metabolic rates and respiration data, together with groupings based on personality adjustment and on the presence of speech problems, showed the same absence of significant relationship.

Predictions based on the various hypotheses of Kretschmer, Cabot, and Sheldon were not born out by the few positive findings. The proportion of significant correlations in this research, employing relatively refined physical classifications, is approximately that found in earlier studies using crude indices or coarse types. It appears, therefore, that in studies of adolescent personality exact somatotypes are not likely to prove more valuable than mere rough impressions of physique. [15 min.]

11:00 A.M. *Anticipation of Future Income by College Students and the Implications for Adjustment.* ARNOLD THOMSEN, Elmo Roper, Market Research, New York City.

This report developed from the hypothesis that in this culture adolescents characteristically set their goals higher than there is any likelihood of their reaching. To test this hypothesis in the field of vocational expectations, 158 college students in the second semester classes of psychology were assigned the task of writing a term paper on their vocational choice. The paper was to be a thorough study of the field they wished to enter, with special emphasis on personality factors. The assignment included this question: "What yearly income do you expect 10 years after you graduate; what income 20 years after?"

The mean income expected by men in 20 years was about twice as much as the income received today by college men who graduated 20 years ago. Women's mean income expectations, though lower than men's were still considerably above average incomes received today by women who graduated 20 years ago. Figures will be shown broken down by occupational expectation and by actual occupational incomes.

Implications of this expectation-achievement discrepancy for future vocational and general adjustment will be discussed. As the individual with a high level of aspiration matures, three possibilities are open: (a) he works hard, etc., and achievements equal expectations; (b) he revises his expectations downward, "accepts the universe"; (c) he keeps his high expectations, but blames the world for his failures. The third alternative may lead to paranoid trends or paranoia. Alfred Korzybski's general semantic theory of happiness (minimum expectations rather than maximum) will be presented briefly. [15 min.]

ABNORMAL

Thursday, September 3, 9:00 A.M.

Parlor B

ROBERT H. SEASHORE, Chairman

9:00 A.M. *The Validity of the Concept of Psychopathic Personality.* HENRY J. WEGROCKI, Saint Elizabeths Hospital.

The concept of psychopathic personality is an ill-defined and very broad one. There is a strong tendency to use "psychopathic personality" as an exclusion diagnosis in those cases where a patient cannot be readily placed into the category of psychosis, neurosis or mental deficiency. This is particularly so if the patient has manifested striking anti-social behavior. A close analysis of the histories of thirty-five male patients diagnosed as "psychopathic personality without psychosis" reveals that the majority show a developmental picture which, psychodynamically considered, is that of a neurosis. This takes the form of a paraphiliac, alcoholic, hysterical or anxiety neurosis. In all these cases psychopathy represents the neurotic resolution of a personality conflict. Somewhat less numerous are those patients who are essentially schizoid or cyclothymic in

make-up and show in their behavior the larval phases of a schizophrenic or manic-depressive psychosis. Least numerous are those individuals, not showing schizoid or cyclothymic coloring, in whom diligent search reveals little if anything of psychogenic significance with respect to their psychopathy. This last group is the only one to whom the term "psychopathic personality" can with some validity be applied. Case material in illustration of the above and a suggested narrower and more precise definition of "psychopathic personality" are discussed. [15 min.]

9:20 A.M. *Rigidity*. KURT GOLDSTEIN, Tufts College Medical School.

In normal behavior every performance is executed in "adequate" time. Shifts in performances are made as required by the task. Rigidity means abnormal fixation upon the performance in action and is frequently pathological.

We may distinguish primary and secondary rigidity.

Primary rigidity involves sequelae of an abnormality of the "Einstellung" mechanism, most frequently observed in lesions of the subcortical ganglia. The performance in action immediately becomes so rigid that responses to extraneous stimuli cease.

Secondary rigidity is due to a primary defect of the higher mental processes; in cortical damage and cortical malformations, such as feeble-mindedness. Only tasks beyond the individual's capabilities are affected. Feeble-minded children show rigidity when confronted by a task requiring the abstract attitude which in their cases is impaired.

The following theoretical interpretation will be offered. 1. Rigidity occurs when an organism is unable to come to terms with "its" environment in an "adequate" way. It is a means of protecting the individual from catastrophic conditions. 2. It is one type of reaction to a situation to which the individual is inadequate. Other types of reactions result in catastrophic conditions and distractability. Rigidity is a consequence of a mental deficiency, especially the impairment of the abstract attitude.

Normal individuals may also exhibit rigidity under certain conditions, namely, in performances beyond their scope. The implications of this theory for education of feeble-minded children will be discussed. [15 min.]

9:40 A.M. *The Structure of Agnostic Symptoms in a Case of Post-Traumatic Dementia*. E. HANFMANN, Mount Holyoke College, and M. RICKERS-OVSIANKINA, Wheaton College.

A patient who showed agnostic symptoms as part of the picture of a post-traumatic dementia was studied through prolonged observations in free and controlled situations. One of the purposes of this study was to discover the factors determining correct recognition of objects in some situations and lack of recognition in others. It was found that living beings in action were better recognized by the patient than inanimate objects. Real objects which the patient was permitted to manipulate and use were recognized more readily than the pictured ones. Objects presented in an appropriate setting (fork with plate, pencil with paper) had an advantage over the same objects presented in isolation. Recognition was always preceded or accompanied by real or imaginary acting out of a

situation relating to the object involved (eating, writing, etc.). Recognition of colors was extremely uncertain and faulty. Agnostic phenomena were found not to be limited to any one sensory field.

From these and other observations it was concluded that the patient was unable to recognize objects *in abstracto*, apart from the concrete action situation in which they could be meaningfully used. The agnostic symptoms were thus found to have the same basic structure as the aphasic symptoms and the disturbances of performance found in patients with brain lesions, and to reflect the general concretization of behavior which Goldstein found to be typical of these patients. Dr. Goldstein has collaborated in this study. [15 min.]

10:00 A.M. *A Case of Primary and Secondary Personalities Showing Cooperation Toward Mutual Goals.* BARBARA S. BURKS, Columbia University.

William James, shortly before the turn of the century, had reached the conviction, on the basis of available data, of the genuineness of parapsychological phenomena. Satisfactory explanations, however, might not be forthcoming for "50 or 100 years," and would necessarily rest upon further facts.

A case of dual personality has been studied which appears more than previously reported cases to offer means to an explanation of the nature of parapsychological phenomena. The secondary personality (S) is "co-conscious" in the sense used by Morton Prince and others. The primary personality (P) is completely accessible to S, but S is accessible to P only through automatic writing, drawings, speech, whistling, and expressive movements. S corresponds in structure rather closely to the classical conception of the subconscious mind.

The speech of S has a somewhat different cadence from the ordinary speech of P; the drawings are symbolic, and have a far higher artistic merit than anything P has ever produced. Poems and other productions of S likewise have more merit than P's productions.

S occasionally seeks permission to produce automatisms, but seldom intrudes without invitation, and only in a situation where important goals are at stake, and where P is in danger of failing. On the other hand, S comes willingly on request, converses entertainingly with P or with others, and accepts work assignments from P which result in a large increase in P's apparent efficiency. Aside from successful writing and problem-solving, S voluntarily undertook personality studies of two of P's friends, the studies being in a Freudian framework, and resulting in demonstrable therapeutic effects. S has been a willing subject for experiments in (1) telepathy; (2) personality structure; (3) effects of training on personality. [15 min., slides.]

10:20 A.M. *An Experimental Study of the Drawing Behavior of Adult Psychotics in Comparison with that of a Normal Control Group.* ANNE ANASTASI, Queens College, and JOHN P. FOLEY, JR., The George Washington University.

The present study is the third part of a project on the artistic behavior

of the insane conducted by the writers under the auspices of the Columbia University Council for Research in the Social Sciences. The following four drawings were obtained from each subject, in the order given: *free choice*, representation of *danger*, drawing of a *man*, and *copy* of a stylized floral design. Each subject was tested individually, being given standard drawing paper, pencil, eraser, crayons, and scrap paper, in standard arrangement. A record was kept of time as well as subject's comments and behavior during the drawing. A total of 680 subjects were employed, including 340 psychotics in 5 institutions (170 men and 170 women) and 340 normal control subjects (170 men and 170 women) equated with the psychotic group in age, marital status, educational and occupational level, artistic training and experience, geographical distribution, and national background.

The drawings were classified according to subject matter and technique and were also examined with reference to a long list of special characteristics assembled from the literature on insane art and from the writers' previous investigation on spontaneous drawings by psychotics. Among such special characteristics are to be found: irregularities of procedure, coloring peculiarities, excessive use of symbolism, incoherence of parts, disproportions, perspective disorders, over-meticulousness, perseverative elaborations, stereotypy, "blotting over," "horror vacui," intellectual realism, stylization, anthropomorphism, micropsia, and macropsia, chain drawings and overlapping figures, and the inclusion of writing. Although the majority of psychotic drawings were not clearly differentiable from those of the control group, statistically reliable differences between the drawings of the two groups were found in a number of specific categories. [15 min.]

10:40 A.M. *Changes in Orientation for Time, Place and Person in Psychopathological Conditions.* ELAINE F. KINDER, Rockland State Hospital, Orangeburg, N. Y.

In the field of psychopathology and individual's ability to recognize and accept socially current standards of time, place and personal entity or status becomes an important criterion of psychological integrity. It is the thesis of this paper that studies of changes in the orientation processes, especially of losses and recovery in specific types of orientation, as these occur in patients suffering from psychopathological conditions, will contribute to our understanding of the psychological phenomena underlying what may be called the "integration" of an individual's mental functioning. Clinical material and data from a preliminary study of changes in orientation found in a group of children hospitalized over a period of years for extreme behavior disorders and showing changes in the balance between predominantly subjectively determined and predominantly objectively determined experience (probably somewhat comparable to the "inner living" and "outer living" of the Rorschach interpretation) will be presented in relation to a program for the systematic investigation of problems within this field. [15 min., slides]

11:00 A.M. *The Diagnostic and Prognostic Significance of the Shut-in Personality Type.* PHYLLIS WITTMAN, and D. LOUIS STEINBERG, Elgin State Hospital.

The shut-in personality type is one in which the psychotic picture is simply an exaggeration of the peculiar type of personality shown throughout childhood. The individual has had few social contacts with others even as a child and is shy, sensitive and withdrawn, or cold, anaesthetic and reserved often with a degree of apathy and indifference frequently mistaken for dullness.

This concept, as described by Adolph Meyer and titled by Hoch, has been thought to have both diagnostic and prognostic significance. However, no objective verification of its validity has been made.

For this study records of the Child Study Bureau of the Chicago Public Schools, made from 10 to 25 years earlier, and before any question of psychosis had arisen, were found on approximately eight percent of the Elgin State Hospital patients checked.

The subjects were divided into two groups: *A*, those who had not been referred during their school years to the Child Study Bureau and, *B*, those whose adjustment or behavior had been such that they were referred. The two groups were then sub-divided according to their present psychotic picture.

These sub-groups were compared with each other on the data gleaned from Child Study Bureau and on the social service history, mental examination, and reports of present status for the patient in the State Hospital.

Differences between the groups are evaluated and the significance of the results for diagnosis, prognosis and prophylaxis discussed. Meyer's concept of "shut-in" personality type as of both diagnostic and prognostic significance is verified as well as corroboration of Langfeldt's theory that the all-inclusive diagnosis of dementia praecox includes both cases of "process" (apparently constitutional) schizophrenia and "schizophreniforme" cases. [15 min.]

PSYCHO-PHYSIOLOGICAL APPROACHES TO THE PROBLEMS OF MENTAL DISORDER

Friday, September 4, 9:00 A.M.

Georgian Room

KNIGHT DUNLAP, Chairman

S. E. BARRERA, College of Physicians and Surgeons, New York, *Shock Therapy*

LOUIS W. MAX, New York University, *Electroencephalic Contributions*

NORMAN R. F. MAIER, University of Michigan, *Experimental Convulsion Phenomena*

CARLYLE JACOBSON, Washington University School of Medicine, *The Approach Through Brain Surgery*

ABRAHAM MYERSON, Tufts College, *Recent Pharmacological Advances*

HOWARD S. LIDDELL, Cornell University, *The Conditioned Reaction Approach*

SOCIAL

Friday, September 4, 9:00 A.M.

Salle Moderne

CLARENCE H. GRAHAM, Chairman

9:00 A.M. *The Beginning Course as a Laboratory in Applied Social Psychology.* S. L. PRESSEY, Ohio State University.

Some students are so unkind as to expect from courses in psychology not only information about the subject of human nature but also help in improving their own human relationships. The paper reports an experiment to see how much this last might be done.

The experiment (with over 300 students) involved the following special features: Students were kept together in the same sections of about 30 each, with the same instructor, for two quarters. Each instructor was given extensive personnel data about each student and was expected to make an intensive study of each, over the two quarters. Class procedure was very informal, involving social group projects, field trips, and social occasions such as picnics and an occasional meal together in a college cafeteria. Amount and nature of acquaintance among the students, status, and groupings were investigated. A variety of devices for dealing with problems were tried. At the end of the two quarters comparison was made with conventional classes as regards social acceptance within the group, total number of campus friends, improvement of maladjusted cases, and liking for psychology, as well as grades on tests and amount of voluntary work done extra. [15 min.]

9:20 A.M. *Classroom and Clinical Measurement of Social Maturation.*
MAX L. HUTT, The Child Consultation Service, Brooklyn, New York.

This is a study of the growth and fluctuation in specified aspects of social behavior over a two year period. It is based upon continuous, intensive observations over this period and includes the total population of a progressive, private school in Brooklyn (The Community School). Clinical examinations of all of these pupils were administered at the beginning and the end of the investigational period. Case records from the school files, containing periodic observations by teachers and Director, as well as standardized test data on school achievement, were available. There were also Stanford-Binet I.Q.'s for all pupils.

The Winnetka Rating Scale for School Behavior and Attitudes was applied at 10 observational periods by the class teachers. Independent observations were made during the same periods by trained, graduate psychology students. The Vineland Scale of Social Maturity was administered at the initial and terminal periods by graduate students who were completing their training in clinical psychology.

The data were analyzed to determine whether: (1) Classroom observations by teachers and/or outside observers yield information about

pupil maturation in social behavior which is comparable to clinically derived data; (2) Measurement techniques yield information which is comparable to teachers' case records; (3) Social behavior (as measured by the Winnetka Scale) is unitary or specific; (4) Increments in growth of the several aspects of social behavior measured follow any common type of growth curve; (5) Growth in social behavior is saltatory or continuous, variable or even; (6) Social behavior is related to general intelligence, school accomplishment or social adjustment.

The importance of the implications of this and previous studies for school and clinical practice is evaluated and discussed. [15 min.]

9:40 A.M. *Goal-Motivated Versus Frustration-Instigated Social Movements.* NORMAN R. F. MAIER, University of Michigan.

Aggression, regression and fixation have been shown to be characteristic features of behavior arising as a consequence of frustration, whereas superior performance in problem situations is associated with good motivation. To fully understand the determiners of action, the relation between frustration and motivation must be systematically analyzed. Some experimental evidence supports the view that frustration and motivation are separate processes and that each is a determiner of action.

If we accept the above qualitative distinction, it follows that social organization may depend upon two different psychological mechanisms. Social movements demand unity of action in a group of individuals. Common goals may serve as one type of unifying factor and common aggression may serve as the other. The two types of unity being based on different psychological mechanisms, we may expect their resulting social movements to display different symptoms.

Since aggression, regression and fixation are associated with frustration, we should expect frustration-instigated movements to be destructive, irrational and stereotyped. The leader will determine the mode of aggression and as long as this avenue of behavior is open he can control the unity. Because frustration does not demand some specific response almost any aggressive behavior will serve to synchronize action. This fact makes it relatively simple to organize frustrated individuals.

Social movements organized around common goals will be constructive and rational. The leader will represent rather than dominate the group. Unified action will be difficult to achieve since the choices will be made by the group. This consideration for differences in choices complicates the social structure and permits greater satisfaction at the expense of forcefulness.

Because of basic differences in group structure, these two types of social movements will have difficulty in understanding each other. [15 min.]

10:00 A.M. *Understanding versus Suggestion in the Social Field.* S. E. ASCH, Brooklyn College.

Modern social psychology has stressed mainly the role of *external* influences in group life, such as suggestion, prestige, imitation, etc. On the other hand, the role of the situation itself, of its structure, the possibilities for understanding it and for dealing with it reasonably, have

been gravely neglected or denied. This one-sided emphasis has, in addition to other consequences, also hampered the careful examination of psychological processes in social situations.

Experiments will be reported dealing with the operations of understanding and suggestion in groups. Situations were studied of varying degrees of structural clearness. Typically the experiments were done in groups of about 10 subjects, of whom all but one—the critical, naïve subject—coöperated with the experimenter. The critical subject was faced directly and immediately by the unanimous—and often false—judgments of a surrounding group of equals before publicly stating his own judgments. Parallel series of experiments were done with tasks of perceptual and social content.

(1) Despite extreme counter-forces from the social field in the clearly structured situations the trend to deal in accordance with the character of the situation prevailed. Quantitative and qualitative results show little evidence of suggestion or imitation. (2) In situations of intermediate clearness the critical subjects did move toward the group response, but the shift occurred within a "region of reasonable variation," the limits of which were quantitatively determined in independent experiments freed of group influence. (3) The results of the extremely unclear situations give superficially the appearance of suggestibility of the classical kind, but closer scrutiny shows that the behavior is guided by an intensely active search for reasonable, objective understanding.

These experiments were done during the year 1941–1942 while the writer was a Fellow of the John Simon Guggenheim Foundation. [15 min.]

10:20 A.M. *Attitudes Toward Social Change of Gallup Poll Youth and Adult Populations.* DONALD H. DIETRICH, Ohio State University:

The problem was to ascertain the responses of two age groups: Youth and Adult to questions pertaining to social changes such as public ownership and labor regulations; to investigate relationships between individual's response and his economic status; sex; geographic location; and degree of urbanization.

Responses to 80 Gallup Poll questions were obtained and Hollerith comparisons were made. Significant differences between responses of various sub-groups at the 10 and 5% levels were established.

Results may be summarized as follows: 1. There are many significant differences between Adult sub-groups; few between Youth. 2. More significant differences occur between Adult economic status sub-groups than any other Adult category. 3. Sub-group responses of geographic location, rural-urban, and economic status reflect those groups' self-interest. 4. Low economic status tends to be correlated with size of "no-opinion" vote. [10 min., slides.]

10:35 A.M. *A Comparison of Racial Stereotypes of Negro College Students in 1935 and in 1942.* MAX MEENES, Howard University.

At Howard University the Katz and Braly list of 84 adjectives was given to 160 students in December 1935 and to 137 students in February 1942. These subjects were asked to describe 10 racial groups with appropriate adjectives from the list. Assuming that the Howard students of

1935 and of 1942 are comparable, the results may throw some light on the effects of recent events and of propaganda on racial attitudes.

The 1942 stereotypes of the English, Jews, Negroes, and Irish are essentially the same as those obtained in 1935. "Boastful, deceitful, and ostentatious" which appear in the 1935 stereotype of White Americans are replaced in 1942 by "sportsmanlike, scientifically minded, and individualistic." In 1935 the Chinese were considered "sly, treacherous, and revengeful," but in 1942 these terms were used instead to characterize the Japanese. The Japanese were considered "intelligent and alert" in 1935 and likewise in 1942, though by fewer subjects. The Germans were regarded chiefly as "scientifically minded and intelligent" in both samples, but in 1942 they were also characterized as "revengeful and cruel." The 1935 description of the Italians, made when the invasion of Ethiopia was in progress, included "revengeful and treacherous"; these terms did not appear in the 1942 stereotype. In neither year was the picture of the Italians flattering.

There is evidence that the subjects characterized "races in general" and did not think in terms of specific representatives of these races when making their descriptions. [15 min.]

10:55 A.M. *Psychological Studies of Inflation and Inflationary Expectations.* GEORGE KATONA, New School for Social Research, New York.

Inflation, a sustained and general upward movement of prices, is not an automatic effect of economic factors, such as excess purchasing power. It takes men and their decisions and actions to put the mechanism of inflation into operation. Psychologists may therefore contribute to the study of inflation and the fight against inflation.

Whether a rise in price of a commodity will be followed by increase or decrease of demand for it depends on what consumers expect of subsequent developments. Laboratory experiments concerning the origin and strength of expectations seem to show: a) Reiterations of statistical data, or categorical statements and pronouncements (e.g., that shoe prices will remain stable or will go up), create relatively weak expectations. b) Presentation of comprehensive context with a clear and consistent structure, from which the subjects gain an understanding of why prices may advance or remain stable, influences the attitudes and expectations to a much greater extent.

In line with psychological findings that the same stimulus pattern may be perceived in different ways and thus elicit different responses, it could be shown that the understanding of, and the response to, the same Government measure, for example a price-fixing order, may have different and even contradictory forms, depending on its frame of reference. In establishing one or the other framework, and in explaining Governmental regulations, psychological factors (clear organization, grouping, distribution of emphasis) are of great importance.

Analysis of recent developments seem to confirm the results of these investigations. Inflation, of course, cannot be checked by psychological means alone since economic facts and measures form the foundation of the

framework for our thinking. But the economic measures should be supplemented by giving a clear orientation for their understanding. [15 min.]

11:15 A.M. *Methodologies in the Study of Musical Eminence*. PAUL R. FARNSWORTH, Stanford University.

The two major ways of measuring eminence stereotypes have been the pooling of ballots and the encyclopedia-space method. In the present study of musical eminence these have been compared and found to agree to the extent of .55 to .80. A third method, that of tabulating page mentions, has been tested in the analysis of histories of music and found to agree fairly well with the two older procedures (.55 to .88). All three methodologies appear to have good reliabilities (.81 to .97). Eighty-nine musicologists and about 500 fairly typical liberal-arts students have been found to agree in their balloting to the extent of approximately .70.

The encyclopedia-space and page-mention procedures have been employed in an attempt to study changes in musical eminence since 1900. For this portion of the study 11 musical encyclopedias, 5 general encyclopedias and 28 histories of music have been analyzed. While in some instances all the musicians have been studied, for the most part the lists were composed of 92 names. J. S. Bach is shown to have received earlier acclaim in the histories of music than in the encyclopedia. The modern histories, modern general encyclopedias, musicologists and college students all agree in regarding Bach, Beethoven, Wagner and Mozart as the four most eminent musicians of history. The rank orders of these four, however, are not all precisely the same. The modern musical encyclopedias replace Mozart with Schubert. [15 min.]

11:35 A.M. *Facial Expressions in Painting, Sculpture, Acted Poses, and Candid Camera Shots*. NELSON G. HANAWALT, New Jersey College for Women, Rutgers University.

This investigation set out to test a belief which is said to be widely held among artists that the painter relies chiefly upon the region of the eyes in portraying facial expression while the sculptor relies upon the region of the mouth. Reproductions of portraits in painting and sculpture are judged by three groups of Os, using a multiple choice method. Group I, the control group, judges on the basis of the whole face while Groups II and III judge on the basis of only the upper and the lower half respectively. There is no reliable difference between Groups II and III in either painting or sculpture, using Group I as a criterion of correct expression. All three groups make good discriminations but as would be expected a half face is not as good a basis of judgment as the whole face.

Since the results in the literature are blurred concerning the role of the upper and the lower half of the face in posed expressions and in "natural" expressions, the study was continued (using the same method) in these two fields. Candid camera shots are used for "natural" expressions. The results for posed expressions are similar to those reported above. Preliminary results for the candid camera shots indicate that there is likewise no difference in the upper and the lower half of the face as a basis for judgment.

The results are discussed in the light of the studies of facial expressions in general. The fact that the region of the mouth is usually given credit for the more important role in textbooks of general psychology is apparently due to a misinterpretation of Dunlap's early results and the failure of early investigators to calculate a statement of reliability of a difference. [15 min., slides.]

MENTAL TESTS AND MEASUREMENTS

Friday, September 4, 9:00 A.M.

Parlor A

HENRY E. GARRETT, Chairman

9:00 A.M. *Functional Analysis and Mental Measurement.* T. W. REESE and JOHN VOLKMANN, Columbia University.

The techniques of mental measurement have not taken full advantage of functional analysis, a characteristic method of modern science. The steps in functional analysis including the selection of a single, principal independent variable; the systematic variation of this variable through a wide range; the determining of functional relations as a consequence of the observation of one or more dependent variables; the construction of a set of assumptions and the deduction of rational equations; the verification of the rational equations by comparison with the obtained functional relations. Examples drawn from sensation, conditioning, and judgment indicate that the mathematical form of the relations is the same for different individual subjects and that the values of the constants are not the same. Hence, individual performance is described by the form of the relation and the particular values of the constants. Differences between individuals are described by the differences between their constants. The theoretical structure that underlies the rational equation makes the constants meaningful.

To mention one contrasting feature, the usual method of describing individual performance by a test-score does not involve the systematic variation of a single independent variable. Indeed, additional variables are sometimes purposely introduced to increase the difficulty of the test, as in the case of the Kohs Block Designs. In those tests in which an independent variable can be identified, values of that variable are arbitrarily chosen; it can be shown that, as a result, one may find a reduced correlation between two sets of scores obtained with the use of two different values of the independent variable.

We are in the process of using functional analysis in the construction of a test, and find that its straight-forward application in mental testing is difficult but not impossible. [15 min., slides.]

9:20 A.M. *Verbal Intelligence of the American Adult.* ROBERT L. THORNDIKE, Teachers College, Columbia University and GEORGE H. GALLUP, American Institute of Public Opinion.

This paper reports results obtained from testing the sample of the American adult public reached by one of the opinion surveys of the Ameri-

can Institute of Public Opinion. The test used was an untimed 20-word power test of word knowledge made up of items taken from the I.E.R. Intelligence Scale CAVD. The population of about 3000 was the standard voting sample of the American Institute of Public Opinion. Testing was done by the regular interviewers of the Institute, and the test was incorporated into one of the periodic inquiries into public opinion on issues of current interest.

The results provide, in the first place, data on a norming population with which other groups of adults can be compared. For this group, the mean score is about 11 words right out of 20, which has been estimated to correspond to an Otis Self-Administering M.A. of about 16 years 4 months. The variability of the adult group was very large—about twice that of a college entrance group. The results provide, in the second place, certain interesting break-downs of the total group. These indicate: (1) Almost no drop with age from 20 to 60 on this type of test material. (2) Small sex differences, favoring the women. (3) Small regional differences, favoring the far western states. (4) Sharp differences by economic level, such that only about 10% of the "under \$20 a week" income group come up to the median of the "\$40 and over" group.

The value and interest of this study lies in the type and scope of sample tested. The limitations lie chiefly in the brevity and limited scope of the test. [15 min.]

9:40 A.M. *Stanford-Binet Intelligence Test Type Performance by a Rhesus Monkey.* BENJAMIN WEINSTEIN, University of Wisconsin.

This study develops further the previously reported matching-from-sample and color categorizing experiments with monkeys. In the basic problem, matching-from-sample, the subjects matched the sample object with its replica in diverse groups of choice objects. Color categorizing involved sorting the red objects from groups of various red and blue choice stimuli, when presented with a specific cue—a red triangle; and sorting the blue objects when presented with another specific cue—a blue ellipse.

In the present study further training was given one of the subjects of these previous experiments. In the new sorting situation the cue objects, triangle and ellipse, were uncolored, i.e., the cue objects now in no way resembled the choice stimuli which they represented. Next the subject was tested in a situation converse to this last problem. The two symbols, uncolored triangle and ellipse, were presented as choice objects in successive trials in which a series of various blue and red objects were employed as cue stimuli. Selection of the triangle was required when a red object was presented, and selection of the ellipse when a blue object was presented.

The stimulus-response patterns of behavior in these two new situations are analyzed. The successful performances are discussed in the light of responses required in certain Stanford-Binet and clinical tests of intelligence.

In order to enable the monkey to master the described problems, several laboratory techniques were devised. These were (1) *planned taming*, a method for securing high attention level in the problem situa-

tion; (2) *tutoring*, a method for giving the subject experimental guidance during the preliminary training; (3) *the maximal stimulus tray*, an arrangement consisting of three-dimensional stimulus objects over food wells on a tray presented under bright illumination. [15 min., slides.]

10:00 A.M. *A Comparison of the Stanford-Binet and Bellevue-Wechsler Scales for Adult Offenders.* I. LEON MAIZLISH, Diagnostic Depot, Division of the Criminologist, Joliet, Illinois.

In this study answers are sought for the following questions: (1) How do the total scores on these dissimilar scales compare when administered to the same subjects? (2) What is the order of difficulty of the tests within the scales? (3) Does that order differ for age groups, literates and illiterates, Negroes and whites? (4) When is the one or the other scale to be preferred?

Adult offenders have been tested with both scales in ABBA order. The Bellevue-Wechsler I.Q.'s, especially the Efficiency Quotients, correlate highly with the Stanford-Binet I.Q.'s. The theoretical implications of the results and the clinical aspects of the use of each test with adults will be discussed. The data are based on tests of 100 subjects.

Mr. Jerome Schiffer collaborated in the testing. [10 min.]

10:15 A.M. *Case Studies of Negro Children of Binet IQ at or Above 160.* MARTIN D. JENKINS, Howard University.

Although numerous investigations dealing with the psychometric intelligence of Negro children have been reported little attention has been given to the superior Negro child. The present study has as its purposes the assembling of a number of cases of Negro children of Binet IQ at or above 160 in order (1) to ascertain the existence of such individuals, (2) to study the origin of the subjects and their characteristics at the time of their identification, and (3) to follow the development of the subjects over a period of years. The present paper is concerned largely with the origin and characteristics of the subjects.

Thirteen subjects, ranging in Binet IQ from 160 to 200 are included. Two of the subjects were included in the writer's previous study of superior Negro children and the additional subjects were identified in psychological clinics in Washington (Proctor, Long), New York (Hollingworth), Chicago (Beckham), and Cincinnati (Bills).

The test performance, school progress, familial background, and racial composition of the subjects are presented. The intelligence test performance reveals qualitative as well as quantitative superiority. EQ's tend to be lower than IQ's. The subjects are typically accelerated in school progress—some to a striking degree. The parents, in most instances, are above average in educational level and occupational status. The subjects range from N to NWW in racial composition.

Individual differences in post-identification are illustrated by two cases—one "successful" and one "unsuccessful." The implications of the findings are discussed. [15 min.]

10:35 A.M. *Geographic Differentials in Mental Deficiency.* CHARLES C. LIMBURG, United States Public Health Service.

In order properly to plan for the identification, care and training of the mentally deficient it is imperative to have data of incidence.

Geographic differentials in mental deficiency are illustrated by the presentation of data from census enumerations, from World War draft examinations, from the number of persons in public and private institutions for the mentally deficient, from selected estimates of retarded children in public schools, from classification records of prisoners received in Federal penal and correctional institutions from all states, and from a limited sample enumeration of the mentally deficient in Kentucky made by the Division of Mental Hygiene of the United States Public Health Service. These data indicate interstate geographic differentials along North-to-South and East-to-West gradients as well as the generally recognized rural-urban and intra-urban gradients.

Some of the more important causes for the findings presented seem to be differentials in fertility, morbidity, socio-economic resources, internal migration, and mortality. The implications of the findings are briefly related to mental test standardization, to the provision of institutional facilities, to educational programs, to occupational recruitment and to public health. [15 min., slides.]

10:55 A.M. *The Psychology of Subjective Status.* HERBERT HYMAN, Columbia University.

Status has been defined by at least two sets of operations: (1) Objective status in which the measurement is in terms of some objective criterion such as income. (2) Subjective status in which the measurement is dependent on the subject's judgment of his own status. A low correlation may be found between status as measured by the two sets of operations. There are two classes of subjective status, first, specific status which is a person's standing relative to other individuals, and with reference to some single dimension such as economic or social status, and second, general status defined by the person's general position according to any standard or combination of standards.

Two main problems are considered. First, is it possible to construct a reliable scale for the measurement of subjective status? Second, is general status a composite of equally weighted specific statuses? Graphic rating scales were constructed for five specific statuses, economic, social, intellectual, and cultural status, and physical attractiveness, and also for general status. The subject judged each of the statuses with respect to three reference groups, total population, friends, and people in his own occupation. Repeat reliabilities for these 18 scales were determined. Only one reliability coefficient is not significantly greater than zero, and 12 are .50 or higher.

The degree of agreement between a composite of equally weighted specific statuses and the judgment of general status is high; for the total population as a reference group, the difference between the two measures is 8.5%. The reference group is a variable of importance in the composi-

tion of general status, as well as in other features of the judgment of status. [15 min., slides.]

11:15 A.M. *Individual Correlation and Factor Analysis.* ERNEST S. PRIMOFF, Washington, D. C.

Identical situations evoke different characteristics of different people; group relations may not hold for individuals. A formulation is developed for shift of individuals' scores from one test to another: $r = 1 - 28.28A^2$, where A is percent of average shift over range. A shift-curve is described, with evidence of use in measuring *actual* variability instead of S.E. which is static for any particular coefficient. Again, "percent guess" is represented by relation to conditions at zero correlation instead of, as with coefficient of alienation, at r for invariant prediction (mean shift relation is $\sqrt{1-r}$; variance relation, $1-r$). Finally, the premise that zero or 100% shift represents perfect correlation, 50% shift zero correlation, is expressed in a second-moment function, so that correlations typified by abilities of one individual may be found. To illustrate, factor analysis is applied to intercorrelations among scores of an individual subject. [10 min.]

MODIFICATION OF PERSONALITY

Friday, September 4, 9:00 A.M.

Parlor B

ARTHUR G. BILLS, Chairman

9:00 A.M. *A Psychogenic Program of Character Development.* ERNEST M. LIGON, Union College.

This is a report of a long time study of methods and goals for character development. Traditionally, character education has been essentially a dichotomy. On the one hand, there are the broad, social character traits which parents and teachers have hoped their children would acquire before maturity. On the other hand, there are the numerous every day problems of child training, ranging from thumb-sucking and enuresis to temper tantrums and seclusive behavior. These latter have, for the most part, been oriented in the life of the child as and when they occur, with little or no reference to the major aims of character education. This study, in the Union-Westminster Character Research Project, has been two-fold. First a tentative list of eight general character traits have been selected as major goals. The criteria used in their selection have included: psychological validity, social desirability, teachability, positiveness, and modifiability. The second phase of the study has been an effort to break these down into many specific trait habits. From a large number of such habits chosen from the literature in child development and mental hygiene, this list has been selected. Only those trait-habits have been included in it which questionnaire studies have revealed to be consistently lacking in children. They have been assigned to the various age levels on the basis of established principles of child development and clinical experimentation. They have been further subdivided according to which type of char-

acter-building agency is best equipped to teach them—church, home, or school. More exhaustive studies for methods of teaching them are now in progress. [15 min., slides.]

9:20 A.M. *Consistency and Change in Behavior Manifestations as Observed in a Group of Sixteen Children During a Five Year Period.* KATHERN MCKINNON, Teachers College, Columbia University.

This study deals with the personality development of 16 children during a five year period—from the time when they entered nursery school until they were eight or nine years of age.

The procedures are (1) to describe children's behavior manifestations that were observed by teachers and reported by them in written summaries, (2) to trace the development of these behavior manifestations over a period of five years with emphasis upon evidences of change or persistence from year to year, and (3) to analyze in so far as possible the influences and factors which might have contributed to the persistence or change in behavior expression during the period studied.

The investigation reveals that the majority of children exhibited dominant characteristics such as *Conformity, Caution, Withdrawal or Invasiveness*, that persisted quite conspicuously, in one form or another, throughout the period of the study. In some cases, there were changes with respect to certain overt manifestations so that predominant characteristics were less conspicuous at the older age levels than they had been at three years of age. Among the children who showed more substantial changes in predominant forms of behavior, the shift was always in the direction of a form of behavior that had been evident but less pronounced at an earlier age.

Among other findings, the study points out that comparable school procedures followed with children showing somewhat similar predominant forms of behavior resulted in change in some cases but not in others. In cases where the educational philosophy of the school was at variance with that of the home, the data reveal that children made a less satisfactory adjustment to all phases of school life. [15 min.]

9:40 A.M. *Some Results from an "Annoyance Inventory" in a Cumulative Study of Adolescents.* HERBERT S. CONRAD and MARY C. JONES, Institute of Child Welfare, University of California.

The "annoyance inventory" employed in the present study lists briefly some 140 items of possible annoyance to adolescents. The items were classified, by the "jury" technique, into 11 categories, such as Injury to Self-Esteem, Untidiness (including three sub-categories), etc. The inventory was administered yearly for five years to a sample of about 300 children, starting in grade VI. The general theory underlying this report is that the negative response of annoyance may deserve the same careful and detailed investigation as has been given to the positive response of interest.

Following are some of the principal results: With few exceptions, the average provocativeness of each item remains essentially stable from year to year, even in this sample of adolescents. The annoyance-scores for the

different categories are rather highly correlated (average, about .75), especially for the three sub-categories of Untidiness (average, about .90). The girls' annoyance at items of Untidiness is, on the average, about one standard deviation above the boys'. An unexpected finding is the progressive decrease (over the five-year period) in similarity between the inter-category correlations for boys and those for girls. The annoyance-score from the total inventory correlates negatively with the score on an adjustment inventory (about $-.40$). The annoyance scores (for individual items, categories, and total inventory) have been found useful in individual case-studies.

Methodological findings include the relation between ordinal position and provocativeness of items, and the effect of changes in item-phrasing on provocativeness.

The annoyance inventory was prepared by M. C. Jones and H. E. Jones. [15 min.]

10:00 A.M. *The Role of the Father in the Development of the Personality of the Stutterer.* ESTHER C. WHITMAN, Worcester Child Guidance Clinic.

A study of 35 male stutterers suggests that there are certain relationships operating in the home which determine the type of personality that the male stutterer develops. Fifteen boys were selected for intensive study because the history and hours of therapy were more informative and because the author had personal contact with them. Although these boys are usually above average in intelligence with good school achievement, there is little striving in any other direction. They are passive, showing neither strong masculine nor marked feminine characteristics. Their interests and attitudes suggest, however, femininity.

The relationship with the mother is marked with change; much hostility is shown at four years, diminishing to marked benevolence and dependence around eight years, and a suggestion that hostility recurs in adolescence. The attitude towards the father, while relatively without significance during the pre-school years, emerges clearly at about seven years. This consists of a feeling of dissatisfaction with him as a father, and a tendency to regard the mother as more adequate. In spite of his inadequacy, he is also pictured in a severely punishing role, and the mother becomes relatively an easier person with whom the boy may identify. In spite of repressed hostility towards her, she is less threatening to him than the father.

An hypothesis is developed in which stuttering is considered as evidence of a conflict in which the father is the cause of the boy's inability to resolve that conflict. The boy represses early his hostility towards a somewhat punishing mother because he finds her relatively more adequate to give him support. The father's inadequacy makes it easier for him to identify with the mother, but the ever-present threat of punishment for supplanting the father prevents complete identification. Caught between the two, he wavers passively without developing strongly either masculine or feminine characteristics. [15 min.]

10:20 A.M. *Personality Traits as Due to Cross-Inheritance.* A. A. ROBACK, University Extension Department, Commonwealth of Massachusetts.

The question of which traits are inherited from which parent has occurred to many writers, particularly in autobiography, and has been broached, among others, by Galton and Ellis, but a comprehensive investigation has never been undertaken to answer it.

Such an investigation embraces (a) an examination of statistical literature on eugenics, genetics, and case studies on deviates, (b) collection of declarations in works by noted people regarding their resemblance in traits and talents to their respective parents, (c) analysis of institutional records (clinics, juvenile courts, homes for defectives and psychopathic wards), (d) questionnaires filled out by a cross section of the population, (e) personal observations made by investigators over a number of years on the families of acquaintances or on physical resemblance noted casually, (f) the statements of breeders.

At this stage of the investigation, which is still in process, the hypothesis is borne out both by hundreds of observations and 650 questionnaires submitted to both sexes that in general, males resemble the mother, and females the father in facial features, physique, temperament, and intelligence. The questionnaire called for data on (a) features, (b) physique, (c) facial expression (mimique), (d) gestures, gait (dynamique), (e) emotional life, temperament, (f) character, (g) interests, (h) intelligence, (i) talents, (j) physical and mental, and moral idiosyncrasies, (k) attachment to either parent, (l) affection shown by either parent.

The applied aspects of this problem are many (1) affecting biography, with overemphasis generally on father; (2) accounting for cross relationships on simpler grounds than the Oedipus and Electra complexes; (3) supplying additional cues in prediction of behavior; (4) in decisions relative to the granting of custody of minors on parental separation. [15 min.]

10:40 A.M. *Influence of Active Participation in a Social Group upon Expressed Level of Aspiration.* ANN MARGARET, Stanford University.

Previous studies indicate that subjects who are informed of group performances tend to alter their privately expressed discrepancy scores. The present study seeks to determine whether this same tendency is present when subjects are active members of a social group, reporting their performances and goals publicly. Each subject performed twice: once in the presence of the experimenter only, recording both performances and goals anonymously; and once as a member of a group of four, announcing both performances and goals to the group by posting them in full view. Tasks used were quoit-tossing and dart-throwing. Results suggest that the effect of active participation in the social group upon discrepancy scores is similar to the effect of reported group averages upon anonymously recorded predictions.

Miss Jean McDonald collaborated in the study. [10 min., slides.]

CONDITIONING AND LEARNING

Friday, September 4, 1:15 P.M.

Georgian Room

CLARK L. HULL, Chairman

1:15 P.M. *Acceleration and Retardation of the Rate of Conditioning by Relevant Reflex Behavior.* W. N. KELLOGG, Indiana University.

Eight laboratory dogs received 3,200 training trials and 320 retention trials in flexion conditioning by what has been called the "shock-shock" method. This method consisted of giving a 2-sec. alternating-current electric shock to one of the front feet as the conditioned stimulus and a 2-sec. d.c. electric shock to the right-rear foot as the unconditioned stimulus. Four of the dogs (the diagonal group) received the conditioned a.c. shock in the left-front foot, and the other four (the homolateral group) received the conditioned a.c. shock in the right-front foot. The homolateral animals were found to be much inferior to the diagonal animals in the proficiency of the conditioning which they achieved. The retention of previously learned conditioned responses was also much inferior in the homolaterally trained subjects. The explanation of this deficiency is to be found in the basic nature of the flexion reflex. The response to a strong electrical stimulus applied to any one member is a flexing of the stimulated member, a flexing of the diagonally opposite member, and a simultaneous extension of the two remaining members (Sherrington). Thus the conditioned and unconditioned stimuli received by the diagonal group both worked towards right-rear flexion, while the stimuli received by the homolateral group aroused antagonistic reaction tendencies. The results are summarized by the following general principle. *Learning which cuts across or interferes with a fundamental pattern of behavior laid down in the structure of the organism, is more difficult than learning which does not interfere with such a pattern.* [15 min., slides.]

1:35 P.M. *A Study of the Effect of Nutritional Deficiency on Conditioned Reactions in Dogs.* W. T. JAMES, Cornell University.

The interest in these experiments was in determining the effect of retarded growth on behavior in dogs. In a litter of five saluki puppies, three dogs were fed enough food for normal growth, while two were given a balanced diet sufficient for maintenance but not for growth. The studies were started when the puppies were three months old. Behavior was compared by an analysis of the conditioned avoiding reaction of the foreleg and by general behavior in the kennel. The retarded and normal dogs did not differ in their ability to form conditioned reactions, but differences were observed in the delay of the CR inhibition of the reaction, extinction, resistance to work, and general behavior correlates, including breathing pattern and heart action. Under kennel conditions the retarded dogs were observed to be less active than the normal animals, but exhibited heightened aggressiveness in any food taking situation. [15 min., slides.]

1:55 P.M. *A Gradient of Pseudo-conditioning.* J. DONALD HARRIS, University of Rochester.

In a previous report (This JOURNAL, 1941, 38, 572) the writer investigated certain inherent non-associative factors arising in conditioning. It was demonstrated by more than mere inference that such factors do operate during actual conditioning, and the course of one of them, habituation, was traced. In that experiment, however, the several effects of the UCS *per se* could not accurately be stated: the phenomenon of pseudo-conditioning could not be segregated from the general facilitation produced on the CR by the UCS irrespective of temporal contiguity.

It is now possible to describe with considerable accuracy the course of both these factors during typical conditioning. Using the same situation and stimuli, and with rats comparable in every way to those of the previous experiment, the effect on a single day's conditioning of preceding that day by 0, 1, 2, 3, 5, 7, and 10 days of 10-shocks-a-day training was investigated. The gradient of pseudo-conditioning thus determined is at a maximum after 1 day of shock training, subsides to a low—but not to zero—after 5 days, and rises slightly after 10 days.

This gradient can be used directly in comparisons with other variables already determined or to-be-determined in this typical conditioning situation. Following Hull, the single assumption is made in the manipulation of these factors, that response strength at any moment is a function of the algebraic sum of all the incremental and decremental factors active at that moment.

The present experiment thus completes the assigning of specific roles in conditioning, of apparatus-habituation, CS-habituation, pseudo-conditioning, facilitation, and finally the role played by that associative factor related directly to the temporal contiguity of stimuli in conditioning-type training. It is of more than passing interest that the theoretical curve of this last factor is distinctly S-shaped. [15 min., slides.]

2:15 P.M. *The Function of the Motor Mechanism in Learning and "Excited Emotion."* EDWARD GIRDEN, Brooklyn College and the University of Rochester.

In a series of recent experiments by the present writer, it was found that in the dissociated drug-state, induced in animals with either curare or erythroidine, a conditioned response (CR) could be developed which consisted of overt (striated-muscle) and autonomic (blood pressure, pulse and pupillary-muscle) responses [*Journal Experimental Psychology*, 31, in press]. Although the drug-state experiences are completely repressed after complete recovery from the drug, these new facts made possible a valid test of the motor theory of learning.

Young puppies were conditioned (Light reinforced with shock-to-paw) in one of two situations: (1) during complete striated muscle paralysis ("deep drug-state") and tested after the partial return of muscular function ("mild drug-state"), or (2) in the mild drug-state followed by tests in the deep drug-state. The results indicate (1) learning occurred in the deep drug-state, appearing as rise in blood pressure and change in pulse rate to Light-alone after training. In the mild drug-state afterwards,

however, the CR remained the same: i.e., striated muscle activity failed to appear with the autonomic CR to Light. (2) CR first established in the mild drug-state included both autonomic and striated muscle components. Subsequently in the deep drug-state, while muscular activity was impossible, the autonomic CR persisted.

It is concluded (1) that the dissociated drug-state is continuous: i.e., no cleavage exists between the mild and deep drug-states; (2) some striated muscle reactions must occur during the training period if they are to become part of the learned pattern. The data will be discussed in terms of other studies and a motor theory of learning and "excited emotion." [15 min.]

2:35 P.M. *Effects of Phenobarbital on Learning and Retention.* MARSHALL R. JONES, Cornell University Medical College and the New York Hospital, New York City.

Four groups of male albino rats were trained on a discrimination problem by a jumping technique. Retention was tested one month later and then the animals were retrained on reversed symbols. Retention for the reversed symbols was tested after a month.

Group I received daily injections of sterile water. Group II got water during learning and phenobarbital during retention periods. Group III got drug during learning and water during retention periods. Group IV got drug throughout.

Results indicate that when the effect of the drug on motivation is ruled out there is little or no evidence that ability to learn a discrimination is affected by the drug.

These experiments were planned and carried out jointly by Carolyn Ewers Jones and the author. [10 min., slides.]

2:50 P.M. *Validity of Averaging-Out Practice Effect in Learning Nonsense Syllables by the Ascending-Descending Presentation Method.* P. S. SHURRAGER, and H. C. SHURRAGER, St. Lawrence University.

Lists of nonsense syllables varying in length from 2 to 16 were tachistoscopically presented to 47 subjects. The rotation anticipation method was used. A blank card was inserted between syllables and all cards were shown for two seconds. The subjects were not told the lengths of the lists prior to presentation.

The subjects were divided into three groups. Group A consisted of 11 college students (women) in experimental psychology, familiar with nonsense material and method of presentation. They learned to three correct repetitions lists of syllables presented in the order 2-2-4-8-12-16-12-8-4-2-2. In Group B were 23 naïve students who learned lists of the same lengths in the same order. In Group C were 12 fifth grade children (six boys and six girls), who learned lists of 2-2-4-8-4-2-2 syllables.

Groups A and B showed a disproportionate increase in difficulty (as measured by repetitions required to learn) between 2 and 4 syllables on the ascending scale. On the descending curve, both A and B (now practiced subjects) showed difficulty to be directly proportional to length of list. With Group C the ascending and descending curves were identical

and directly proportional to length of list. The implications of these results will be discussed. I. C. Stewart collaborated in this work. [15 min., slides.]

3:10 P.M. *Relation of Length of List to Number of Repetitions Required to Learn to Completion Lists of Nonsense Syllables Varying in Length from 16 to 32.* I. C. STEWART, MacMurray College.

Lists of nonsense syllables varying in length from 16 to 32 were tachistoscopically presented to 16 subjects. The rotation-anticipation method was used, a blank card was inserted between syllables, and syllables and blanks were shown for two seconds each. The syllables were taken from Glaze's list and were of low association value. The lists were presented in the order 16, 20, 24, 28, 32, 28, 24, 20, 16 and the criterion of learning was three correct repetitions. The subjects were 16 college women who had had thorough previous training in learning nonsense syllables presented in the manner described.

When practice effect is averaged out, the number of repetitions required to memorize lists of from 16 to 32 syllables varies by less than one repetition. This result is compared with previous results on the relation between difficulty and length of list in immediate and delayed recall of lists of comparable length presented only once. P. S. Shurrager and H. C. Shurrager collaborated in this work. [15 min., slides.]

3:30 P.M. *An Organizing Procedure in Role Memorizing.* JOHN F. DASHIELL, The University of North Carolina.

College students were given serial lists of 14 monosyllabic words to be memorized, the lists being differently constructed. The instructions emphasized only the number to be recalled, not their order. But record was kept by E of the order of the recalls. Where the word-lists permitted, eight of the nine subjects showed measurable tendencies to re-group the words in sequences that represented certain separate thought-contexts. The organizational emphasis in interpreting memory is thus given support; but the associational emphasis must be recognized as supplementary. [10 min., slides.]

3:45 P.M. *An Experimental Study of Transfer of Training in Motor Learning.* PATRICIA WOODWARD, University of Pennsylvania.

The purpose of this study was to determine whether transfer of training occurs between two tasks which are nearly identical in pattern of motions, but are composed of very different materials, typical of the electrical device and textile industries. The near-identity of the two tasks was established by two methods of motion analysis. One hundred seven trade school girls were tested on one assembly and repeated it approximately a week later; on five consecutive days half this group learned and practiced the other assembly with no instruction in general principles. A statistically significant difference was found between the final levels of performance of the control and experimental groups and of 19 matched pairs. This is interpreted as due to the identity between the two assem-

blies, either in motion pattern or in the general work situation. [10 min., slides.]

ATTITUDE AND MORALE

Friday, September 4, 1:15 P.M.

Salle Moderne

EDWIN R. GUTHRIE, Chairman

1:15 P.M. *The Effect of Social Change on Morale.* JEROME M. SEIDMAN, Brooklyn College.

Eight self-evaluating, free response questions were formulated. The first four were concerned with the "likeability" of the change, suggestions for improvement, resultant changes in "important" life experiences, and any other information which the subject believed to be relevant; the other four related to specific changes in everyday activities.

Four hundred and seventy-six tenants of a metropolitan, government rehousing development were used in an exploratory study. The sampling technique, rapport indices, evidences of social causation, and factors relating to improvement in morale will be discussed. [10 min.]

1:30 P.M. *Patterns of Religious Thinking Among 835 College Students.* MARY C. VAN TUYL, University of Michigan.

The key item of this study was built from material given in the autobiographical reports of 835 university students. The item attempts to describe the individual student in three respects: first as to general pattern of religious ideas; second as to surety and decision of expression; and third as to how much the student seems to be cognizant of relations between his expressed religious ideas and the ideas he has been exposed to in his regular education, i.e., how much he is "thinking."

Within the triple coding of the item 42 tri-varying types are possible. Only 33 of these, however, appeared out of the data. These types are further qualified and differentiated one from another when placed in relation with other items which give religious ideas in some detail.

The patterns of religious-mindedness which emerge are checked against sex, class in college, intended vocation, difficulties in high school and/or in college, grades, fraternity and sectarian affiliations, time of first significant change, if any, in religious ideas, and a number of other factors in the student's present and previous living.

It becomes clear in this study that a general mean or mode of single aspects of individuals is of little significance. As more and more of the available information from the autobiographies is put under analysis, the differences in the individuals become more apparent. Certain "types" do emerge which have considerable similarity in profile, religiously and otherwise. These "types" cut across the three great religious affiliations, Jewish, Catholic and Protestant. A large percentage of all three are moving or have moved away from the authoritarian religious patterns.

Some measures of reliability and validity in the handling and in the material have been possible and these are indicated. [15 min., slides.]

1:50 P.M. *Attitudes and School Status.* SAMUEL TENENBAUM, Girls' High School, Brooklyn.

The purpose of the investigation was to determine to what extent attitudes expressed by children toward school, teachers and classmates correlate with intelligence, achievement in school work, conduct and proficiency marks, school progress, and amount of absence. The subjects were 639 elementary school children whose attitudes were obtained by means of the investigator's Attitude Questionnaire.

Twenty per cent of the group expressed sentiments indicating they were unhappy in school, while 40 per cent were highly critical of the school situation. Girls consistently expressed more favorable attitudes than boys. Eight per cent indicate dislike of their present teacher, while six per cent express dislike of teachers in general. About the same proportion of children indicate unfavorable attitudes toward classmates. The children do not associate school with pleasure. "Fun" and "enjoyable" are mentioned infrequently, when compared to references centering around "getting an education," "making money," "getting on in the world." The children who dislike school mention the teacher most frequently as the cause. A group of "problem" children was compared with "normal" children for school attitudes.

Eight variables—I. Q., E. Q., absence, past and present proficiency and conduct marks, grade progress—were correlated with attitudes toward school, teachers, and classmates. The association between these variables and the attitude scales was so low as to have no prognostic or predictive value.

This investigation does not support the theory that failure is always, or in the majority of cases, associated with resentment and "hate." Those children who were failed and did poor work in school did not express school attitudes which were notably different from those of bright and accelerated children. [15 min.]

2:10 P.M. *Changes in Attitude of College Students.* SETH ARSENIAN, Springfield College.

This study attempts to answer the following questions: (1) Do basic evaluative attitudes of students change during four years of college experience? (2) Does the vocational orientation of the college course select students with characteristic pattern of evaluative attitudes and influence the amount and the direction of the attitudinal change? (3) What factors are related to change in religious attitude? Factors studied are: curricular and extra-curricular influences, plasticity and rigidity of student, change in concept of religion, etc.

The Allport-Vernon study of values was administered to three successive classes of Freshmen entering a men's college preparing for the professions of physical education and social work. To 76 freshmen who continued their college course through the senior year the Allport-Vernon test was administered a second time.

Through appropriate statistical techniques the changes in attitude over the four year period have been studied for the two major groups. To study changes in the pattern of attitude in freshman and the senior years the intercorrelations between six evaluative attitudes have been calculated.

A special questionnaire was devised and used to study factors associated with change in religious attitude. A more intensive study is made of students who showed extreme positive or negative changes or no change at all in religious attitude during their college course.

There are certain definite changes in evaluative attitudes which have implications for the theory and practice of education and of higher education in particular. The change in religious attitude and factors associated with the change seem to me of special interest and importance. [15 min.]

2:30 P.M. *The Nature of Changes in Attitudes of College Students Toward War over an Eleven-Year Period.* VERNON JONES, Clark University.

The attitudes of college men toward war have been studied over a period of 11 years by means of the Thurstone-Droba Scale and, over part of this period, by a scale constructed by the writer. Several entire classes have been followed over their four years of college. The results based on changes in average attitude are treated separately for three periods: (1) the period of 1930-1937, during which there was a gradual trend toward pacifism; (2) the period from Munich to December 1941, during which there was a slight reversal of the 1930-37 trend; and (3) the period following Pearl Harbor.

The results based on the notion of a single continuum (and involving the averaging of attitude scores) conceal many of the most dramatic changes taking place as a result of the change in world conditions from 1930 to 1942. The study of individual items reveals several facts of interest concerning the nature of attitudes and ways of changing them. Individual variability, for example, was found to be very great. Also it was found that large changes occurred in specific attitudes, while average attitude changed very little—a fact which seems to have implications for education and propaganda. These and other similar results indicate the limitations of the concept of a single militarism-pacifism continuum in studying attitudes toward war and peace. The results would seem to be more consistent with a theory of multiple continua. [15 min., slides.]

2:50 P.M. *Attitude Fluctuation as a Measure of the 'W' Factor.* RAYMOND B. CATTELL, Harvard University.

Advances in establishing generalizations about personality development depend both upon the discovery of clear cut variables and upon the devising of tests whereby these variables may be more briefly and accurately measured. Assuming that the 'w' factor of character integration and stability is now a sufficiently established and definite personality variable, the present research sets out to explore a type of test situation in which its influence may be expected to be considerable and by means of which it may be measured.

The hypothesis governing the present test design supposes that there will be greater fluctuation of attitudes—either through the pressure of *ad hoc* experimental influences or through the normal impact of daily events—in individuals whose sentiments are less well integrated in the dynamic hierarchy which presumably functions in the 'w' factor. Though there are many analyses of attitude tests from the point of view of consistency of test items there seems to be as yet no data relating the consistency of the individual's responses to personality traits. Accordingly a series of attitude tests was devised, some dealing with deeper sentiments, some with attitudes to the self and some with more superficial attitudes. These scales were administered three times to the same set of subjects, with intervals of one day and one month. Each subject was given a fluctuation score and the fluctuation scores were correlated with ratings of 'w' factor variables, with extraversion and with a number of other traits.

Both with children and with adults the results show clearly, first, that fluctuation tendency is a consistent 'trait' of the individual, and secondly, that the fluctuation measure is very significantly related to 'w.' Further, fluctuation on deeper sentiments is more diagnostic of defective 'w' than is fluctuation on more superficial sentiments and attitudes. Some contrasts between the results with children and with adults throw light on the nature of the connection. [15 min., slides.]

3:10 P.M. *The Development of the Ideology of Altruism and Fairness in Children.* BEATRICE A. WRIGHT, State University of Iowa.

Two aspects of ideological development in children were studied: (1) The structure of the ideology (e.g., fairness vs. generosity). (2) The scope of the situation considered in making a moral judgment (equity).

Each subject (there were 36 eleven year olds and 36 eight year olds) was shown eight toys only half of which were very attractive. Four of the toys he could keep for himself and four had to be given to a second child. This permitted a generous, fair, or selfish distribution of the toys. After the behavior experiment a series of hypothetical situations involving the distribution of these eight toys, were presented.

The relative occurrence of fair and generous judgments is significantly related to age. The eleven year old children advised a fair distribution of the toys considerably more often than did the eight year old children; and conversely, the younger children made significantly more generous judgments than did the older children. The difference between fairness and generosity is coordinated to a theory of the dynamic role of ideology in which the ideology functions by structuring the need systems of the person.

As the child becomes older, his moral judgments are based increasingly on the characteristics of the particular situation (equity). The biserial correlation between equity and age is $r_{bis} = .42 \pm .08$. With an increase in equity, there is also an increase in the number of aspects of a situation in equity, there is also an increase in the number of aspects of a situation seen to have bearing on the judgment (breadth of equity). The curvilinear correlation between equity (x) and breadth of equity (y) is $\eta_{y,x} = .62 \pm .05$. The results on equity are linked by a theory coordinating

greater differentiation and enlargement of the life space with age. [15 min., slides.]

3:30 P.M. *Morale Cues in War Communiques.* JOSEPH SHOR, New School for Social Research.

This study seeks to discover Nazi propaganda policies in the reporting of war news. Two primary values may proceed from such discoveries.

The Nazi conception of morale, that morale desired by their propaganda chiefs, finds expression in their military communications to their home population. Detailed comparison with the British communiques, for types of sentences and special references, reveals sharply divergent attitudes toward governmental responsibility, formalism, and authoritarianism, most visible in Nazi pretenses of infallibility and invulnerability. We note in the German communiques fewer explanations of military policy, or announcements of action in process or of certain types of admissions of losses and reassurances against dangers. Other aspects of propaganda policy, also related to the study of mass communications, are the abnormally rigid, "controlled" length of the Nazi communiques, unresponsive to the changing volume of military activity, the pseudo-democratized heroization of representative individuals, the pretentious use of "according to plan" expressions for building and maintaining an image of omnipotence and for purposes of concealment, and, possibly, the unwittingly predictive use of the word "our" in situations of elation and of apprehension. The reputation for veracity of the Nazi communiques receives little support from our study.

Of somewhat more immediate interest is that part of the study in which we have analyzed the devices used in plugging victory and in admitting defeat, by concealment, by fabrication or by a re-presentation and re-interpretation of the military action. Fortunately, recent events permit a more balanced distribution of success and failure situations for study. The scheme of devices developed may facilitate insight into changing states of morale and shifting foci of popular and military concern.

The study, under the direction of Hans Speier, co-director of the Research Project on Totalitarian Communication, was made possible by a Rockefeller fellowship. [15 min.]

3:50 P.M. *A Quantitative Analysis of Hitler's Speeches.* RALPH K. WHITE, Cornell University.

Using a method similar to the conversation-analysis techniques developed with Lewin and Lippitt, Hitler's speeches, in the book "My New Order," were quantitatively analyzed. Each paragraph was characterized in terms of its dominant meaning or "theme." Reliability coefficients were computed.

In general, the results merely express in quantitative form the prevailing American assumptions about Hitler's propaganda techniques, but there is one important exception. It is often assumed in this country that Hitler's propaganda "glorifies war." Actually his speeches show an overwhelming preponderance of anti-war themes. Whether or not he himself consciously wants war as such, he at least recognizes that most

of his hearers do not. To justify specific aggressive acts, he consistently resorts to the creation of a "paranoid" world-picture, which represents other nations or groups as wanting to destroy Germany, and which invokes the motive of fear as a reason for fighting against the foreign war-makers. To put it quantitatively, more than 80% of the paragraphs are elaborations of four basic themes: "they are evil"; "we are good"; "they are weak"; and "we are strong." Since this combination involves ideas of both grandeur and persecution, it is perhaps more aptly characterized by the word "paranoid" than by any other single word.

Within these four basic themes, subthemes were differentiated. For instance, the pronoun "they" has a varying content (the Jews, the Marxists, the bourgeoisie, the English, etc.), and various sorts of evilness are attributed to them (e.g., they kill, they rob, they enslave, they lie, they are cowards, they poison our blood, they are different from Us). By totalling up the relative frequency with which these various subthemes occur, with reference to a particular group, it is possible to characterize quantitatively several of the official Nazi stereotypes. [15 min.]

PROJECTIVE TECHNIQUE

Friday, September 4, 1:15 P.M.

Parlor A

JOHN E. ANDERSON, Chairman

1:15 P.M. *A Differential Study of Manual Autistic Movements.* MAURICE H. KROUT, Chicago City Junior Colleges.

The discovery of generalized (group-wide) meanings of manual autistic gestures hinges on two facts: a) conflicts experimentally induced in human subjects and b) reliable inter-sex differences in the forms of symbolic expression. This report covers both phases of the problem.

After five years' trial and error, we settled upon 15 experiments designed to induce conflicts in the S's. One control experiment was arranged not to precipitate a conflict. The theory was that blocked impulses, not released through speech, would be shunted into motor paths leading to autistic movements. Thirty-four manual autistic types of movement were observed.

The 1611 experiments involved in this report were shared equally by both sexes. There were 67 males and 67 females. Altogether 2376 manual autistic movements were recorded for the males and 2361 for the females. Each experiment lasted four minutes, and a series of 16 experiments required over an hour. On this basis about 150 experimental hours were spent on laboratory work.

Inter-sex differences were discovered for average latencies following the conflict. For males this was 0.454; for females, 0.432 minutes. The highest latencies for women were recorded in connection with conflicts involving a) attachment to females b) a jilted suitor situation c) the recall of shameful episodes d) an unhygienic duty and e) the loss of a proffered prize. The highest latencies for men were found in connection with a) crushes b) a jilted suitor situation c) enuresis and d) the recall of shameful episodes.

Male-female differences appeared very clearly in 63% of the patterns. Using a critical ratio of 1.0 as our criterion of reliability, we found 15 manual autistic patterns to be predominantly male and 10 to be predominantly female. The nine movements in which the critical ratios were less than 1.0 (though as high as 0.7, 0.8, or 0.9) were regarded as neutral. The critical ratios for males ranged from 1.2 to 8.3, and for females from 1.6+8.6. A possible interpretation of this difference is proposed. [15 min.]

1:35 P.M. *Some Factors Related to Substitute Value at the Level of Fantasy.*
GEORGIA BENNETT, Worcester State Hospital.

An experiment on substitute activity, using the interrupted task technique, indicates that when central tasks are used, a degree of substitute value greater than that in neutral tasks can be produced for normal subjects. However, for the schizophrenic subjects only a higher degree of initial tension is created. Analysis of the subject matter of the two projective tasks involved suggests that the inability of the patient group to express inwardly directed aggression at a reality level, or to express violent aggression in *any* symbolic way, may be the important determinants in the lack of substitute value of the task for the schizophrenic subjects. Analysis of this material for other topics reveals a tendency for the patients to avoid mention of sexual relationships and to deal with "anaclitic" thema. The normal subjects, on the other hand, frequently deal with such topics as marriage and love, and are able to create situations of sexual failure and disappointment. The normal subjects also deal more frequently with topics of anxiety and economic insecurity.

These results lead to the consideration of the problem of the efficacy of fantasy. The implication of the present study seems to be that not only is the schizophrenic patient unable to find adequate substitutes at the level of real events, but also at that level of unreality represented by fantasy. The nature of the thema produced in the tasks suggests that schizophrenic fantasy does not constitute an area of substitute or vicarious satisfaction because it does not deal with adult stresses. The hypothesis is further considered in relation to a separate investigation utilizing the Thematic Apperception Test. [15 min.]

1:55 P.M. *The Recall of Fairy Tales in Normal and Hypnotic States.*
MARGARET BRENNAN, The Menninger Clinic.

The experiments to be reported constitute an attempt to study the problem of the revival of childhood memories. Hypnosis is used as a research tool to the end of investigating the omissions and distortions which characterize the normal recall of fairy tales. Subjects are asked to recall in the normal and hypnotic states standard fairy tales heard in childhood. The process of the "reconstruction" of the fairy tale in hypnosis, and the relation of the quality of both the original omissions and the distortions to the strivings and attitudes of the subject as shown in the Thematic Apperception Test, will be discussed. It will be shown that certain kinds of critical omissions and distortions are characteristic

for the group as a whole, and also that specific variations may be understood in terms of individual needs and conflicts as shown in the Thematic Apperception Test. [10 min.]

2:10 P.M. *Projective Reactions to Induced Frustration as a Measure of Social Adjustment.* E. H. RODNICK and S. G. KLEBANOFF, Worcester State Hospital.

Two groups of 12 subjects each, selected from the best and most poorly adjusted members of an N.Y.A. camp devoted to industrial training, were tested by means of a technique previously reported by Rodnick and Rotter.

Each subject was frustrated by surreptitiously controlling his score in a game involving motor coordination. The technique was so designed that after the subject had demonstrated his proficiency in the game he was prevented from attaining the goals he had set for himself. The particular details of the situation were such that motivation and interest were maintained at a high level.

Immediately before and after the frustration the subject was given a modification of the Thematic Apperception Test to obtain his projective reactions to a series of pictures. The details (themas) were then scored in a quantitative and objective fashion for the type of content. A comparison of the results of the two projective tests served as a measure of the subject's reactions to the frustration.

The following differences between the two groups were found to have statistical significance. The more poorly adjusted group showed, as a result of the frustration, (a) a marked decrease in themas of superiority of the central characters in the stories, (b) a considerable increase of themas of aggression, and (c) a decrease of those dealing with "emotional states." The better adjusted group, on the other hand, showed an increase in the themas dealing with "emotional states," and no decrease in the incidence of superiority of the central characters.

Composite scores were then derived for each subject based upon the individual shifts in these categories of projections resulting from the frustration. These scores were found to differentiate the two groups with a "t" of 3.4 ($p = .001$). [15 min., slides.]

2:30 P.M. *An Experimental Investigation of Projection.* LEOPOLD BELLAH, Harvard Psychological Clinic.

Projection is one of the concepts very much in the focus of recent psychological thinking. We wished to investigate the existence of projection experimentally. For this purpose we defined projection in accordance with Freud's formulation, as the ascription of wishes and sentiments which one has oneself to subjects or objects of the external world.

The following procedure was employed: seven subjects, students of Harvard University, were given ten pictures of the Thematic Apperception Test (T.A.T.) and asked to tell stories about them. The first three subjects got pictures 6-10 first, and then pictures 1-5; the remaining four subjects had the pictures in the proper order from 1-10.

Throughout the telling of the respective first five stories of each subject the experimenter made no comments after having given the initial instructions. After the fifth picture, however, sharp criticism was made of the stories told, and the criticism was repeated in modified form after each story from then on. The form of criticism after each picture was kept practically identical for all subjects.

The underlying assumption was that the subjects would resent the sharp criticism of the experimenter, and, if the hypothesis held, would project their aggression, by introducing more aggression into these stories than into the ones told without criticism. Accordingly, the stories were later analyzed as to the number of verbs and nouns connoting aggression.

A modification of the analysis of variance was used. The overall difference in aggression between stories with and without criticism was found to be significant between the one per cent level and the two per cent level ($P=0.017$).

Thus the hypothesis of projection could be considered essentially correct. There were additional data supporting this result, based on twenty-five more cases. Supplementary hypotheses about projection were necessary to explain some of the results. [15 min.]

2:50 P.M. *The Limits of Material Obtainable in the Single Case Study by Daily Administration of the Thematic Apperception Test.* SILVAN S. TOMKINS. Harvard Psychological Clinic.

A single subject was presented daily (five days a week) with a different picture, and asked to write a story about it. This was continued for a period of ten months. In addition, the complete set of Thematic Apperception Test pictures (30) was administered three times, at intervals of three months. The third administration was immediately followed by a fourth administration under the influence of alcohol. Further, the subject was required to record all his dreams over the ten month period.

Chief results were: (1) Main themes appeared in the first thirty stories given at the beginning of the investigation. (2) In spite of attempts to make the stories different (according to instructions given) main themes were repeated in second, third and fourth administrations. In certain cases, a common problem ran through the four stories to the same picture, but with different solutions projected. (3) Stories given under alcohol illuminated those preceding, in a manner analogous to associations to a dream. Particularly striking was the manner in which elements of the three preceding stories were woven into the story under alcohol. (4) Stories are independent of conscious moods. During a two week period of euphoria, pleasantly toned pictures elicited very grim stories. (5) Notwithstanding the recurrence of major themes, the long term daily administration of pictures *did* elicit important phantasies which appeared neither in the original thirty pictures, nor in the same set under alcohol. (6) There was evidence of transference phenomena, of resistance etc., but the absence of analysis was probably responsible for the relative constancy of the phantasies elicited. [15 min.]

3:10 P.M. *Formal Aspects of the Thematic Apperception Test.* FREDERICK WYATT, Harvard Psychological Clinic.

Phantasies produced in response to the selected pictorial stimuli of the Thematic Apperception Test were first viewed in terms of a model derived from the treatment of dreams and daydreams in psychoanalysis. Consequently, these phantasies were perceived as reflecting openly or in symbolic disguise the interplay of the conscious and unconscious dynamics of personality. It was the task of interpretation to recognize the instinctual constellations and conflicts in their recurrence in a number of responses. Thus the interpretation of the Thematic Apperception Test has so far proceeded predominantly on the basis of an analysis of content. But whereas the interpretation of dreams and daydreams in psychoanalysis is supplemented by free association and by other material, the procedure by its very character being extensive, the interpretation of phantasies in the Thematic Apperception Test is in principle limited to its own material, or, in other words, is intensive. Hence it becomes necessary to utilize the given material to the fullest extent. As the Rorschach Test has successfully demonstrated, not only the (projective) content but also the mode, or form of reactive self-expression is indicative of personality traits and syndromes. Pursuant to this idea a system of categories was set up in order to comprehend the formal and structural qualities of thematic productions. Three types, or 'levels' of form were explored: (1) Mode of presentation of the 'story' (fantasy)—comprising the character and sentiment of presentation, the introduction of figures, time and location, et al. (2) Comprehension and adaptation of the stimulus, as acuity, elaboration of the stimulus, the usage of details, et al. (3) Subjective reactions, such as bias, hesitation, expressions of like and dislike, et al. In a number of detailed personality studies these categories were found to be expressive of significant patterns and syndromes and thus by supplying a structural framework to enlarge the scope of interpretation. These findings will be reported and the implications of formal aspects in the Thematic Apperception Test discussed. [15 min.]

CEREBRAL FUNCTIONS

Friday, September 4, 1:15 P.M.

Parlor B

DONALD G. MARQUIS, Chairman

1:15 P.M. *Observations on Cerebral Dysfunction.* D. O. HEBB, Queen's University.

In assessing the clinical effects of brain damage, account must be taken of the dysfunction that may accompany pathological changes in an area of incomplete destruction. The existence of the dysfunction can be inferred from the fact that clean-cut surgical removals have in general less deleterious effect than the pathological changes, but more direct evidence as to its nature can be found in cases where the disturbance is followed by recovery.

Cases are reported which show that an apparently complete loss of function, of years' standing, may be reversible, and that abnormal function may similarly persist for weeks or months with later recovery. The functions which may be affected include simple motor and sensory functions (paresis and anesthesia), speech (aphasia), and the complex functions of intelligence and personality (dementia and psychosis). In some cases the disturbances are of the kind for which von Monakow explicitly framed the theory of diaschisis, but occur in circumstances which rule out his theory.

Acknowledgements of assistance are made to Drs. Wilder Penfield and Donald McEachern of the Montreal Neurological Institute. [15 min.]

1:35 P.M. *Functions of the Cerebral Cortex in the Mating Behavior of Female Rats.* FRANK A. BEACH, Department of Animal Behavior, The American Museum of Natural History, New York City.

Female rats in the experimental colony at The American Museum frequently display the masculine copulatory pattern. In addition, these females, which are apparently physiologically normal, exhibit regular estrous cycles, and during heat they manifest characteristically receptive behavior in response to sexually aggressive males. Previous workers have reported survival of feminine mating reactions in completely decorticated female rats, cats and rabbits. Earlier studies from our laboratory led to the suggestion that the mating behavior of the male rat involves the cerebral cortex. Extensive injury to the neopallium appears to eliminate or markedly reduce the male's capacity for sexual arousal. In the light of these results from separate experiments the study to be reported was conducted to determine the incidence, in the female, of masculine and of feminine copulatory behavior before and after removal of the cortex. The effects of hemi- and complete decortication upon the bisexual performance of castrated and intact females will be described. [15 min., slides.]

1:55 P.M. *Interference Factors in Delayed Response in Monkeys after Removal of the Frontal Lobes.* ROBERT B. MALMO, Norwich State Hospital, and ALVIN J. KLEINSASSER, Aviation Medical Division, Kelly Field, Texas.

After bilateral removal of the frontal association areas, two monkeys in Experiment 1 succeeded in delayed response performance when darkness was maintained during the delay interval. Unlike normal animals, however, the operated animals failed when a bright light was turned on in the cage during the delay interval. The indirect method of delayed response was used throughout the experiment; that is, light—instead of food—was used as the cue stimulus.

These results made necessary the revision of previous hypotheses concerning the functions of the frontal association areas. The hypothesis is suggested that removal of the frontal association areas in primates leads to a marked impairment in their general capacities for memory, because the loss of these areas renders them more susceptible to retro-active inhibition.

On the basis of a retroactive inhibition hypothesis one would expect to obtain more interference (lower scores on delayed response) when the cue stimulus and the interpolated stimulus are similar than when they are dissimilar. In order to obtain data on this point, Experiment 2 was performed with two frontal lobe animals.

In Experiment 2, three conditions of interpolation were used during each of eight daily sessions: (1) non-interpolation; (2) similar interpolation (cue stimulus and interpolated stimulus were alike in color); (3) dissimilar interpolation (cue stimulus and interpolated stimulus were different in color).

Both animals performed well under condition 1, but they performed poorly under conditions 2 and 3. A hue difference between the cue stimulus and the interpolated stimulus did not significantly reduce the interference effect produced by the light interpolation.

The implications of these results for hypotheses concerning frontal lobe function are discussed. [15 min., slides.]

2:15 P.M. *Hyperactivity in the Cat After Ablation of the Frontal Lobes and its Relation to Visually Controlled Aspects of Behavior.* KARL U. SMITH, The University of Rochester.

This study is based upon the investigation of some 36 animals. In the cat, localized extirpation of the most rostral part of the cerebral hemispheres, i.e., the cortex anterior to the cruciate sulcus, produces generally marked hyperactivity. Limited lesions within this area may bring about temporary alterations of activity following which the animal may return to its normal status. Extirpation of the cortex posterior to the cruciate sulcus within and including the boundaries of the so-called motor cortex does not produce these changes in activity, and if the motor areas are removed along with the frontal areas, the hyperactivity is no greater than that found with the frontal cortex removed alone.

Cats which display an increase in activity, as measured both by a stabilimeter and a rotating cage method, invariably portray forced following-responses to visual stimuli. This reaction consists of a very persistent tropistic-like following of moving objects or of a moving person. Animals which do not display this behavior do not show marked levels of hyperactivity. Accordingly, it is believed that the hyperactivity occurring after removal of the frontal lobes involves, in part at least, the modification of the inhibitory mechanisms of control of visual orientation. It is also concluded that the hyperactivity of the cat following removal of the frontal lobes may be accounted for in terms of a generalized modification of the same order in the sensory-motor system, for the same type of forced reactions to other stimuli may also be observed in the operated animals. [15 min., slides.]

2:35 P.M. *Modification of Perceptual Responses in Patients with Unilateral Lesions of the Frontal Lobes.* G. K. YACORZYNSKI and LOYAL DAVIS, Northwestern University Medical School.

To study the behavior of patients with unilateral frontal lobe lesions produced surgically 20 different experimental methods were used. The

only positive results were obtained on tests which measured perceptual responses. The changes in perception are of such nature that they cannot be understood by postulating one basic principle, nor are the concepts which have thus far been advanced to explain the functions of the frontal lobes sufficiently comprehensive to interpret all of our results.

Five patients, four with a right frontal lobe lesion and one with a left, differed from the controls in the following ways: (1) The threshold of perception was raised so that the time to apprehend either a word or a geometrical figure was increased. (2) The number of objects perceived in ambiguous figures, resembling the Rorschach test, was decreased. (3) Visual illusions which are normally seen by everyone were either not perceived, or, in the case of the Müller-Lyer illusion, the illusion was exaggerated. (4) Memory for visually presented objects was decreased, which interpreted in conjunction with other test results, may be due to a disturbance of attention. (5) The reversals of figures with reversible perspectives, such as Rubin's figures, the staircase, etc., were either absent or decreased, which may also be due to a function of attention.

In one patient a restitution of the reversals of the figures with reversible perspectives was observed 6 months after the operation, and more completely a year later.

It is suggested that the elation of some patients with frontal lobe lesions may be due to the disturbed perceptual processes in which the ordinary inhibitory stimuli are no longer perceived as such. [15 min., slides.]

2:55 P.M. *Modifications of Design Block Performance Before and After Corpus Callosum Section.* FRANCES H. PARSONS, University of Rochester School of Medicine and Dentistry.

This report discusses results of tests made on 18 epileptics before and after section of the corpus callosum. Psychological studies have been made by the Division of Psychiatry on these patients from the Division of Neurosurgery, preoperative tests beginning in 1939-40. In the cases reported here no uniform Kohs Block design response pattern was found, but some postoperative performances resemble the type of response reported by other workers as accompanying known cerebral lesions. Persistence of the "organic" response is discussed in relation to intelligence test level, extent of postoperative apraxia, and psychiatric history. As periodic retests now continue, many patients reach preoperative levels. [15 min., slides.]

LEARNING AND MEMORY

Saturday, September 5, 9:00 A.M.

Georgian Room

HERBERT S. LANGFELD, Chairman

9:00 A.M. *Sign Differentiated Responses to Two Attributes of a Stimulus by Rhesus Monkeys.* H. F. HARLOW, University of Wisconsin.

Six psychologically sophisticated monkeys were trained on a problem involving a principle utilized in the Weigl test—response to either

the color or the form of a stimulus. Three of the animals were tested using a matching technique. The presence or absence of food under the sample-object (food-sign) was the differential sign for response to color or to form. The other animals were tested using an oddity technique, employing two different colored test trays (board-sign) to indicate positive response to the single object unlike the other two in either form or color.

In both situations obviously, *either* color or form selection might be required in identical stimulus-configurations.

Training for all subjects was carried out in a stepwise procedure to the criterion of 90 percent correct responses in 50 trials, which constituted a daily test-period. A chance score would not exceed 34 percent correct for the situations used.

All six subjects solved the problem, in that the above criterion was met in the simplest possible situation which fulfilled the test requirements in an unequivocal manner.

Additional data concern the results obtained from extending the problem in the following ways: (1) increasing the number of stimulus-objects, both like and unlike the objects used in training; (2) testing for generalization of the "Weigl" principle by using new stimulus-objects; (3) introducing tests of delayed reaction to the differential color or form attributes of a single stimulus. These data will be discussed in terms of their relationships to results obtained in similar psychological investigations. [15 min., slides.]

9:20 A.M. *Koch's Method of Learning Code Reception.* HELEN PEAK, Randolph-Macon Woman's College.

This exploratory study has attempted to reproduce the conditions for rapid learning of the code reported by Koch as a step toward discovering the maximal conditions for learning this skill. Thirteen students practiced code characters 30 minutes per day, 4 days per week. Practice began with receiving at a rate of 60 characters per minute. One character was added at a time and practice continued after each addition until characters introduced thus far could be copied 90% correct. Results indicate a slower learning rate than Koch reports but there is evidence that the method is superior to methods now in use which begin with slower rates. Correlations between rate of learning code, Seashore music tests, American Council Psychological tests and other measures suggest possible methods of personnel selection. Elsie Rickards collaborated in this study. [10 min.]

9:35 A.M. *Degree of Learning and Proactive Inhibition in Retention.* R. H. WATERS, University of Arkansas.

The paper summarizes an investigation of the influence of degree of learning upon proactive inhibition as measured by the retention of a second list. One list of 18 nonsense syllables was given 0 to 40 presentations prior to the learning of a second list. The learning of the second list was divided into two periods separated by an interval of 20 minutes.

During the first period the list was given five presentations and during the second period, following the 20 minute interval, was brought to a criterion of two perfect successive repetitions. Evidence for proactive inhibition was sought in the learning records following the 20 minute interval. The number of trials and anticipations required to complete learning, the number of correct anticipations in the first and second trials after the interval, and the number of intrusions from the first list were studied to determine the presence of proactive inhibition.

Results indicate the absence of proactive inhibition in the relearning records. A small amount is present on the first trial but vanishes on the second trial after the interval. The amount present does not vary consistently with degree of previous learning.

The experimental data were contributed by 10 subjects who learned an 18-syllable list under each of the seven work conditions at the rate of one condition per day. Two cycles of the experiment were completed. [15 min., slides.]

9:55 A.M. *Retroactive Inhibition and the Interruption of Tasks.* WILLIAM C. H. PRENTICE, Swarthmore College.

This investigation sprang from a proposal by Koffka that the superior retention of interrupted tasks reported by Zeigarnik was due in part to increased stabilization of traces affected by "interruption-tensions." Such a theory may be interpreted as implying that traces of interrupted tasks should be more resistant to any form of interference and specifically to retroactive inhibition. Koffka's theory of Ego-forces suggests an extension of his treatment of interruption to include other motivational conditions which lead to improved recall.

This study presents a re-analysis of some data published by J. W. Nagge (J. Exper. Psychol., 1935, 18, 663-682) in a form that shows retroactive inhibition to be reduced for tasks learned under hypnosis as compared to tasks learned under normal conditions by the same subjects.

Evidence is presented comparing intentional learning with incidental learning. The results from these experiments show that retroactive inhibition is less marked for intentional learning than for incidental learning.

Further experiments are presented in which Zeigarnik's conditions are compared to those obtaining when all tasks are completed. The data show that retroactive inhibition is less marked for the interruption arrangement than for uniformly completed tasks.

Additional incidental evidence concerning the technique of Zeigarnik is presented, and the theoretical implications of such evidence are discussed together with the major findings. [15 min., slides.]

10:15 A.M. *Habit Reversal in Serial Verbal Discrimination Learning.* DAVID C. MCCLELLAND, Wesleyan University.

Discrimination learning has been treated theoretically by Spence, Hull, Hilgard, and others as a cumulative process in which the correct response is strengthened by reinforcements and the incorrect weakened by non-

reinforcements. The success of a choice is determined by the sum of the positive and negative tendencies.

One deduction from such a theory is that reversal of the response required to a stimulus will be increasingly difficult as learning proceeds. The greater the strength of the positive response to a stimulus, the harder it should be to elicit the negative response to it, and vice versa.

This deduction was tested in human discrimination learning by presenting subjects with a list of 15 words, one every two seconds, some of which were to be said and some of which were not to be said. The subjects had to learn for each word whether to say it or not. The correct response was rewarded by a bell. After original learning had proceeded to 11 in 15 and 15 in 15 correct choices in each of two groups, the subjects were asked to make the reverse response to each word.

The results showed positive transfer in both cases to the reversed discriminations, the size of the transfer increasing markedly with the degree of training on the first response. The greater the strength of $S-R_1$ the greater the transfer to $S-R_2$ when R_2 was an alternative incompatible response. This result is out of line with present theories of discrimination learning and suggests that the success of a choice reaction is a function not only of the direction of training but also of the absolute difference, without regard to sign, in the strengths of the alternative reactions. [15 min., slides.]

10:35 A.M. *Perceptual and Intellectual Factors in the Production of Concepts.* EDNA HEIDBREder, Wellesley College.

This paper reports part of a study on the production of concepts. The study as a whole investigates the hypothesis that the perception of objects is the *dominant* (neither the simplest nor the most primitive) mode of human cognition, and that the production of concepts is a variant of this dominant mode which may be regarded as the *distinctive* (though not dominant) mode of human cognition. Data from previously reported parts of the study indicate a regular and positive relationship between the length of time required for the production of a concept and the extent of the departure from perceptual modes of response its production involves.

The method used throughout the study is a modified form of Hull's procedure, which in turn is a modified form of a memory experiment. The subject's task is to learn the names (nonsense syllables) of successive series of drawings, presented at a uniform rate and in a systematically random order, and so arranged that it is possible, but not necessary, for the subject to respond to similarities from series to series, and eventually to identify each drawing by a name indicating its membership in a class. The procedure provides objective measures of the points in the experiment at which concepts are produced. The subjects were 173 college students, each of whom was studied individually. Each subject, if successful, produced nine concepts.

This paper concerns concepts produced under two contrasting sets of conditions. One set may be described as complex and concrete, the other as simple and abstract. Concepts were more readily produced under

the first set of conditions. The relation of this fact to the general hypothesis will be discussed. [15 min., slides.]

10:55 A.M. *Generalization: Absolute and Relative*. B. R. PHILIP, Fordham University, and H. E. PEIXOTTO, Hunter College.

The problem of this experiment is to study generalization of response and generalization of stimulus as a function of discrimination. Five lists composed of from four to twelve pairs of nonsense syllables were presented to 500 high school students by means of film projection. The results are based on the four longer series. The shortest list being used only for practice.

An average generalization curve was found which was identical for generalization of stimulus and of response. This curve shows no gradient but only uniform generalization. Generalization of both response and of stimulus was differentiated according to absolute and to relative generalization. Discrimination, inherent to the methodology, was identical in both cases, and was found to vary inversely with the difficulty of the syllables and directly with the degree of learning. Absolute generalization of response was found to bear no relation to the degree of difficulty of the syllables, and to increase in the initial stages of learning with a slight decrease in the later stages for the longer series. Relative generalization of response varied directly with the difficulty and decreased with the degree of learning. Absolute generalization of stimulus had a tendency to vary inversely with the difficulty of the syllables while relative generalization of stimulus bore no relation to difficulty. Average generalization varied inversely, while relative discrimination varied directly with length of list.

The results are discussed in relation to those of Gibson on intra-list generalization as a factor in verbal learning. [15 min., slides.]

11:15 A.M. *Intentional and Unintentional Learning as they Affect Retention of Nonsense Syllables*. WILLIAM C. BIEL, Miami University.

This experiment was an attempt to compare the effects of intentional and unintentional learning on the retention of nonsense syllables when the amount of original learning was equal. In previous experiments the number of presentations of the material to be learned has been kept constant and not the amount of original learning.

Twelve nonsense syllables of zero-associational value were presented to two groups of subjects by means of a tachistoscope for .33 second each. One group of subjects ($N=126$) observed the syllables with its attention directed toward the fulfillment of tasks other than the learning of the syllables; the other group ($N=72$) observed with the intent to learn. Six easily legible but slightly different types of print appeared in each presentation of the list. The subjects in the first group were instructed to indicate the most legible printing type for each of the 12 presentations of the list. The subjects in the second group were instructed to disregard the printing-type differences and were to learn the 12 nonsense syllables which were presented to them five times. Average immediate recall scores for the two groups were approximately the same.

Forty-eight subjects in the nonintent group were matched with an equal number of subjects in the intent group on the basis of the number of syllables reproduced correctly after presentation of the material.

Retention scores after a 19-day interval showed no statistically significant differences between either the two total groups or the two matched groups.

This study was done in collaboration with Mr. Ronald C. Force. [15 min.]

PERCEPTION AND READING

Saturday, September 5, 9:00 A.M.

Salle Moderne

ROBERT B. MACLEOD, Chairman

9:00 A.M. *Eye-movement Habits in Reading Instrumental and Vocal Music.* O. IRVING JACOBSEN, Shurtleff College.

Eye-movements were photographed during the reading of instrumental music, which included one, two, three and four parts; and of four-part selections made up of whole, half, and quarter notes. These selections were read by poor, average and excellent readers, in order to determine the stages of development in music reading. Analysis was made of each type of reading, which was shown on a chart. The analysis indicated the procedure of reading pitch and rhythm.

The extent of the "eye-performance span" in the readings of each selection was determined also. A comparison was made of reading in the bass clef and the treble clef, and also how notation on leger lines, and accidentals were read.

Eye-movements were photographed also during the reading and singing of vocal music, first by singing the Latin syllables prior to the words, and then by singing the words directly, also by poor, average, and excellent readers. [10 min.]

9:15 A.M. *Fundamental Factors of Comprehension in Reading.* FREDERICK B. DAVIS, Cooperative Test Service of the American Council on Education.

A factorial analysis of nine skills measured by the Cooperative Reading Comprehension Tests and judged to be measures of the most important skills involved in comprehension in reading has been completed. The results indicate that reading comprehension, as measured by the Cooperative Reading Comprehension Tests, is not a unitary ability. Rather, it requires the use of two general mental abilities and several rather specific skills.

The first of the general abilities required is Word Knowledge. This would naturally be expected, since to read at all one must read words. The second of the general abilities is more interesting. It is antagonistic to word knowledge and is composed largely of ability to manipulate verbal concepts and to relate them meaningfully. It seems appropriate to call it Reasoning in Reading.

In addition to these two general abilities, the following fairly specific skills seem to be involved in reading comprehension: (1) Sensitiveness to implied meanings, (2) Ability to grasp the detailed statements in a passage, (3) Ability to infer a writer's intent, purpose, and point of view, (4) Ability to select the appropriate meanings of words in the light of their particular contextual settings, (5) Ability to follow the organization of a passage and to identify antecedents and references in it, (6) Ability to identify the literary devices used in a passage and to apprehend its tone and mood, and (7) Ability to synthesize the main thought of a passage.

The results of this study are of value to clinicians in the diagnosis of reading difficulties and to research workers in the construction and validation of tests of reading comprehension. [15 min., slides.]

9:35 A.M. *Explorations in Reading Patterns*. RUTH STRANG, Teachers College, Columbia University.

Within recent years many persons have become interested in adolescent and adult reading as it operates in daily living. With these reading patterns this investigation is primarily concerned. It was conducted by an interview-testing technique applied to 112 persons of varied age, economic, and occupational status. The collection of data about each subject took, on the average, an hour and a half.

From simple statistical analysis and from "insightful analysis" of the individual cases certain hypotheses emerged. The first of these relates to the complexity and uniqueness of each person's reading pattern. High school students of the same age show markedly different patterns of maturity in their reading interests and proficiency. Persons in the same occupational field vary widely in their choice of reading material, their answer to the question, "What did the author say?" and their rate of reading. Certain reading habits, interests, and abilities, however, are frequently associated in patterns which vary in other respects.

The second hypothesis is that certain persons can comprehend passages they have read better than they can express the author's thought to others. This difference may be due to a number of factors, among them meager stimulation to communication in the environment, foreign background, and laconic habits of thought and expression.

The third hypothesis is that an apparent relation exists between a subject's interest in and enjoyment of an article, his estimation of its difficulty, and his proficiency in reading it.

The fourth hypothesis is that people read with their experience and their emotions. In the majority of cases the freely written responses were colored by the reader's prejudices and personal experiences.

The fifth hypothesis, based on the intensive study of individual cases, suggests that an individual's reading pattern has a control core or radix which, more or less, determines its nature. [15 min.]

9:55 A.M. *A Comparison of "Minimum Visual Distances" Between Two Luminous Points and a Broken Circle under Different Degrees of Brightness*. CURT BERGER, Cornell University.

The experiments to be reported were made to test criticisms of "mini-

imum visual distance" measurements with two small points. Most commonly accepted for such measurements is the broken circle, first suggested by Landolt.

The "resolving power" of optical systems is measured by the minimum distance at which two points appear as separated images. For the human eye which accommodates to the distance, "the minimum visual distance" should increase proportionally. This has been found true with two small luminous points, but the use of two points for such measurements has been criticized because of the smallness of the retinal images and the lack of a secondary control.

To test such criticisms measurements of "the minimum visual distances" were made with two luminous points and also by means of a broken selfluminous circle under different degrees of brightness. In both cases it was found that the function measured *decreases* with increase of illumination, with the points represented by a straight line, with the circle by a curve with a rapid fall in the beginning. The mean deviations of both methods are approximately equal.

It can therefore be concluded: (1) that the increase of "visual acuity" with illumination is mainly due to the use of black symbols; (2) that the use of two luminous points is not less reliable than the use of a broken circle; (3) that a broken circle has no validity for measurements of the "resolving power of the human eye." [10 min., slides.]

10:10 A.M. *The Double Function of Monocular Lines in Binocular Depth Perception.* HANS WALLACE, Swarthmore College.

Tschermak and Henning have proposed an explanation of Panum's phenomenon as the result of a double function of a monocular line. When a single line is presented to the left eye and two parallel lines to the right eye, the two lines which are seen upon fusion often do not lie in the same plane; the right one of the two lines lies farther back. The authors claim that this is due to separate stereo functions of the single line of the left eye with either one of the two lines of the right eye.

Evidence in support of this hypothesis is gained by the addition of identical lines to the monocular diagrams in conjunction with appropriate fixation. If the single line of the left eye is now made to fall between the two lines of the right eye when the two monocular diagrams are superimposed, one line is seen to be in front and the other one in back of the fixated extra line; both of the perceived critical lines display the proper stereo effect although they are in the left eye represented by only one line. When this single line is slightly slanted and the lines in the right eye diagram are vertical, the two lines are seen to slant away from the observer. When the two lines are slightly curved while the single line is straight, both perceived lines form a curve in the third dimension. Such a double function of a monocular line can be ascertained even when one of the partners in the other eye falls entirely on identical retinal points. The theoretical implications of these results will be discussed. [15 min., slides.]

10:30 A.M. *The Influence of Size of Test Stimuli in the Measurement of Stereopsis.* LEONARD C. MEAD and JOHN L. KENNEDY, Tufts College.

The stereograms in the Stereometric Section of the Keystone Diagnostic Series are commonly used measures of stereopsis. Special instruction is given to avoid using the size cues as indicators of distance.

The responses of over 60 subjects to each of the three divisions of the 23 Keystone cards have been analyzed. The ten items of each division have been separated on the basis of the visual acuity (size) required to see them.

Curves of the percentage of correct judgments for each of the four visual acuity levels show that errors increase in relation to both decentration and size. Thus, in spite of special precaution, the "% stereopsis" assigned to a subject is in part dependent upon size of the test items, an unfortunate situation if the experimenter is interested in the measurement of stereopsis alone. [10 min., slides.]

10:45 A.M. *The Inter-society Color Council Color Aptitude Test.* FORREST LEE DIMMICK, Hobart College.

In February of 1940, the Inter-Society Color Council was requested to prepare a test suitable for evaluating workers in industries where an essential requirement is accurate discrimination of small color differences.

A test has been devised and standardized which meets the original requirements and offers a tool for the study of "color aptitude in other applications." This test consists of 40 matching judgments which require a very fine degree of discrimination. The colored materials were specially prepared by Mr. Carl E. Foss from the most permanent substances available. They are held to rigid spectrophotometric standards and are reproducible.

The test utilizes saturation series of two reds chosen because they offer diagnostic confusions to color blind subjects. Later forms will include other color dimensions.

The test has been made up in three degrees of difficulty. A short form serves as a screening test for complete red-green deficiency. An intermediate form diagnoses degrees of color deficiency from low normal through anomalous to complete R-G deficiency. The complete aptitude test has been standardized on a large group of the "general population" consisting of college students, office workers, and semi- and unskilled workers, and upon groups of trained color workers in two branches of the textile industry.

Two procedures have been standardized; one which requires completion of 40 matches and corrects the score on the basis of the time taken; and one which permits the subject to work on the test for a limited period of time.

On the basis of present results, percentile ratings of various scores have been plotted for the "general population" group and for the "color workers" group. [15 min.]

11:05 A.M. *Binaural Interaction and the Nature of Pitch Perception.*
W. R. THURLOW, Princeton University.

The hypothesis has been advanced that the change of pitch with intensity is due to a shift in the position of maximal stimulation of the basilar membrane. A method of testing this hypothesis is to hold the position of maximal stimulation constant while varying other factors, and observe whether a change in pitch takes place. This can be accomplished by introducing by earphone a tone in one ear of given frequency and given high intensity; then presenting this tone together with a tone in the opposite ear of the same frequency and intensity, and noting whether a change in pitch occurs: when one tone is added to the other, no change in the position of maximal stimulation occurs, but a change in the pattern and number of nervous impulses does occur. The method just outlined was adopted in the present experiment.

Results showed that at the high intensity used there was a very definite pitch shift when the tone of equal frequency and intensity was added in the other ear. Further experimentation showed that a shift in the pitch of the monaural tone could be produced by introducing a tone of different frequency in the opposite ear, provided both tones were of high intensity. The pitch shift, expressed as a function of the frequency of the affected tone, regardless of the frequency of the affecting tone, is generally similar to that gained from experiments on the pitch shift caused by increasing intensity.

The results of this experiment indicate that a change in pitch occurs in the absence of a shift of the position of maximal stimulation on the basilar membrane; they indicate further that the central interaction is not of a spatial character. [15 min., slides.]

11:25 A.M. *The Role of Audible Frequencies in the Perception of Obstacles by the Blind.* MILTON COTZIN, Cornell University.

As we previously found, the blind perceive obstacles by means of aural mechanisms. This study deals with an analysis of the role played by the various audible frequencies.

Four observers were used—two totally blind and two with normal vision. After preliminary practice series which duplicated the procedure and corroborated the results of our earlier study, the main experiments were undertaken.

A cart, running on piano wire suspended tautly through the center of the experimental room, carried a loud-speaker and semi-directional microphone. This cart was driven by a reversible DC motor whose speed could be controlled by *O* sitting in the soundproof room. Sounds sent into the loud-speaker and picked up by the microphone were transmitted through a 20-watt power amplifier and an attenuator to high fidelity ear-phones worn by *O*.

The movement of this apparatus was so noiseless that all the *O*'s in the control experiments failed to detect the wall in every trial. All the *O*'s were successful in perceiving the wall when a "thermal noise" was used, *i.e.* they stopped the moving cart at a far and near approach. The *O*'s

reported a definite rise in pitch in the "thermal noise" as the loud-speaker neared the wall.

When pure tones of low frequencies from an RCA Beat Frequency Oscillator were used, the O's were unable to perceive the wall, *i.e.* they failed to stop the cart before it collided with the wall.

Intensive limens were computed by the continuous method of limits when the "thermal noise" was 6', 3', and 0' from the wall. There were no reliable differences in the loudness of the noise when it was 6' or 0' from the wall. [15 min.]

11:45 A.M. *A Study of Discriminative Serial Action.* HERBERT B. WEAVER, University of Pennsylvania.

The purpose was to study discriminative serial action, with special emphasis on the long response times called by Bills and other mental blocks.

One hundred college students were tested on a discriminative serial action task consisting of manual response to color. Their response times (1000 for each subject) were automatically recorded and individually measured, correct response times and error times being recorded separately. The performance was analyzed for speed, accuracy, variability of response times, and frequency of long response times (defined as response times equal to or greater than twice the median response time). Some of the subjects were retested one month later.

All performance measures were found to be highly reliable as shown by test-retest correlation. No sex differences were found for any of the performance measures. Performance was independent of scholastic aptitude. All performance measures except accuracy improved upon retest. Speed of response was unrelated to frequency of long response times; variability of response times was closely related to frequency of long response times.

Response times in the immediate neighborhood (two before to two after) of long response times and of errors were averaged separately for each position for each subject, and the combined averages for all subjects were studied. Response times in the neighborhood of long response times were found to have a characteristic pattern with respect to the mean of all response times; the same was true of response times in the neighborhood of errors. The two patterns are qualitatively distinct, however. Interpretation of the findings is offered. [15 min., slides.]

PHYSIOLOGICAL

Saturday, September 5, 9:00 A.M.

Parlor A

JOHN F. DASHIELL, Chairman

9:00 A.M. *Pupillary Responses as Indicators of Deception.* F. K. BERRIEN, Colgate University.

This study compared the utility of pupillary and blood pressure responses as indicators of deception. The apparatus simultaneously re-

corded both actions—the former by means of a manually operated pen attached to a telescope whose verticle cross-hair was kept tangent to the subject's pupil by the examiner. Sixty subjects were examined in pairs, one in each pair having committed a "laboratory crime." Correct identification of the "criminal" based on interpretation of both records occurred in 76 per cent of the cases, blood pressure usually, but not always, being the more accurate indicator. Some types of pupillary responses recorded do not conform with the prevalent notions of the action of the pupil in emotion. Advantages and disadvantages in the use of pupillary responses for deception studies will be mentioned. [10 min., slides.]

9:15 A.M. *A Technique for Recording Retinal Action Potentials from the Human Eye.* LORRIN A. RIGGS, Brown University.

Continuous electrical contact with the cornea is maintained by the use of a contact lens as a mount for a recording electrode. When the eye is stimulated by light, the resulting action potentials of the retina are impressed upon this electrode over the path of low resistance through the eyeball. The form and magnitude of these potentials, suitably amplified and photographically recorded, provide an index of the response of the eye itself without the complicating influence of the higher visual centers. It has thus been possible to compare foveal and peripheral responses and to study the intensity and adaptation effects in the eye.

The experiments were conducted in the Psychological Laboratory of the University of Vermont under a grant for the necessary apparatus by the National Research Council. [10 min., slides.]

9:30 A.M. *Varying Aspects of Attention as Indicated by Electroencephalographic Recordings.* TRIGANT BURROW and WILLIAM GALT, The Lifwynn Foundation.

Investigations of neuromuscular patterns of tension and particularly of tensional modifications in relation to neurotic disorders led to a series of experiments in the field of attention by the scientific staff of The Lifwynn Laboratory. These experiments consisted, in part, of series of records of brainwave patterns secured under different conditions of attention. In order to check the results with the frequency spectra as traced by the Grass analyzer, the writers repeated certain of their electroencephalographic tests at the Neurological Unit of the Boston City Hospital. In the course of these experiments with neuromuscular modifications in relation to attention we came upon several brain-wave patterns indicative of different aspects of the attentive process. This paper written at the suggestion of Dr. Frederic A. Gibbs, through whose courtesy the experiments were undertaken, presents the major indications of these aspects of attention as shown by the electroencephalograph.

Cortical activity was studied in the right and left motor and occipital regions, and simultaneous spectra were recorded from 2 regions and, on occasion, from three. Series were made both with the eyes open and with the eyes closed. Records were taken under conditions of mental work, relaxation, during reading, and in cotention. Cotention is the name given by the senior author to a tensional pattern in which symbolic or projective

attention is suspended. We have employed this phase of attention as part of our technique in correcting mental distractibility in both normal and neurotic subjects. This modification is brought about as a result of individual training in oculomotor balance. Slides will be shown illustrating typical changes in each attentional mode. [15 min., slides.]

9:50 A.M. *The Reliability of Electrocardiograph Variables.* W. EDGAR VINACKE and RAYMOND FRANZEN, Research Division, Civil Aeronautics Administration.

The electrocardiograph technique has long been used in psychology, physiology, and particularly medicine without any adequate attempt to determine the reliability of variables appearing on the records. The present study analyzes these variables statistically to see which are reliable.

Two tests were obtained from 95 high school and 320 college students so that half of the retests were administered by the same examiner and half by an examiner different from the one giving the first test. The Sanborn stethocardiograph which records simultaneously the stethogram and E.K.G. was used. Each time the four leads were taken followed by a 15 second period of exercise after which the four leads were retaken. Heart sounds were recorded in a different area for each lead. Variables analyzed were heart-rate, duration P-wave, PQ interval, QRS complex, ST interval, T-wave, and TP interval and duration of sounds. Using linear correlation the following questions were answered: (1) What is the day-to-day variation? (2) What is the variation between examiners? (3) To what extent do errors of quantitative translation influence reliability? Each lead for each variable before and after exercise was so evaluated.

The results show that most of the measurements based on a single beat no matter how chosen are not reliable, but when based on the sum of three beats they are for duration of PQ, QRS, and ST and for all four amplitudes. No reliable measures were found for the stethogram. Quantitative translation was accurate and change of examiner found to have little effect. Using measurements from various leads the reliable factors were intercorrelated and an attempt made to work out statistical indices of abnormality.

This research was carried out by the W.P.A. in conjunction with the C.A.A. pilot testing program. [15 min.]

10:10 A.M. *Differential Physiological Responses to Ideational and Startling Sound Stimuli in Adolescents.* NATHAN W. SHOCK, University of California and the National Institute of Health, Bethesda, Md.

Changes in pulse rate and skin resistance following association word stimuli and startling auditory stimuli were measured in 44 boys and 35 girls with a mean age of 16.5 years (S.D. 0.5 yr.). Continuous records of pulse rate and changes in skin resistance of hand and foot were made on a photokymograph. Pulse rates were counted for each of five three-minute intervals following presentation of the stimulus. Changes in skin resistance were measured in ohms. Twelve words, chosen for their pleasant, unpleasant or indifferent emotional connotations were presented at thirty second intervals to each subject. A total of eight auditory stimuli of

varying degrees of intensity and quality were also presented at one-minute intervals.

Analysis of the results showed that startling auditory stimuli produced greater decreases in skin resistance than did ideational stimuli consisting of association words. In contrast, the ideational stimuli produced greater increases in pulse rate than did the startling auditory stimuli. [15 min., slides.]

10:30 A.M. *The Dependence of Psychological Development on Nutritional Deficiencies during Prenatal Life.* GEORGE L. KREEZER, Cornell University.

This report is intended to describe work in progress. The investigation was undertaken: (1) To obtain evidence bearing on the effect of nutritional deficiencies engendered by the war on the psychological development of the next generation, and (2) to determine whether mental deficiency may be produced experimentally by nutritional deficiencies in the mother during the gestation period. The rat is used as the experimental animal. The basic procedure consists in limiting some essential nutritional component during gestation and comparing the psychological performance of the offspring with that of a control group. The psychological tests are made up of a battery intended to sample different capacities—learning and problem solving, emotional traits, activity level, drive, and susceptibility to behavioral disorders. Nutritional factors so far investigated have been vitamin B₁ and calorie intake. Preliminary results will be reported. [10 min., slides.]

ABNORMAL

Saturday, September 5, 9:00 A.M.

Parlor B

HARRY HELSON, Chairman

9:00 A.M. *Normal vs. Schizophrenic Perception of Similarities.* DAN L. ADLER, University of Rochester.

The following study is based upon the hypothesis that one can distinguish between normals and schizophrenics on the basis of differences in their conceptualization of similarities. It was believed that schizophrenics tended to categorize as similar those items which look alike, that is, have point to point similarities. Normals, it was thought, tended to see as similar those things having the same meaning, that is, functional rather than peripheral similarities.

Sets of pictures were designed to test this hypothesis. Fifty normal college sophomores and 50 schizophrenic subjects were given opportunity to match each of eight master pictures with either: a) pictures peripherally but not functionally similar to the master picture, or b) pictures functionally but not peripherally similar to it, or c) pictures neither functionally nor peripherally similar to it.

Scoring reported here is based on the frequency with which functionally similar pictures were matched to the master.

Odd-even reliability of the choices was $.914 \pm .01$.

(1) Normals made significantly more choices of the functionally similar type than did the schizophrenics. Out of a maximum score of eight, the mean score of the normals was 7.45; of the schizophrenics was 3.57.

(2) Within the paranoid and hebephrenic groups of schizophrenics there is a marked correlation between absence of deterioration and frequency of matching based on functional similarity.

(3) Related to this, patients with superior prognosis made more functionally similar choices than did patients with poor prognosis. Thus, on the basis of psychiatrists' judgment, patients expected to be discharged within the month had a mean score of 5.43; patients expected to be discharged within a year had a mean score of 3.33; patients classified as probably incurable a mean score of 2.80.

This study is being carried on with the collaboration of Miss Jean Neasmith, University of Rochester. [15 min., slides.]

9:20 A.M. *Deterioration in Schizophrenia as Reflected in Performance on a Variety of Psychological Tasks.* DAVID SHAKOW, Worcester State Hospital.

This report is concerned mainly with the analysis of the relationship between two ratings of deterioration and the performance on several psychological tests of 25 schizophrenic patients. The psychological studies, carried out ten years ago, include the Stanford-Binet scale, the Army Alpha test, the Kent-Rosanoff Association test, the Rorschach test and various aspects of motor function, including steadiness, speed of tapping, reaction time and learning. The first of the ratings, "contemporary deterioration," is based on the average of three ratings given independently by psychiatrists at the period of the psychological studies. The second of the ratings, "present deterioration," was obtained by averaging the rank orders in which the patients were placed by a group of six experienced persons on the basis of present status.

The correlation between the two measures of deterioration, after the lapse of approximately 10 years, is .73. Certain variables derived from the devices employed give coefficients in the range from .45 to .70 for both measures of deterioration. These are: mental age and vocabulary on the Binet, Alpha sub-test 3, 0+ % in the Rorschach test and simple auditory reaction time. Others give correlations of this magnitude for present deterioration alone: Alpha total score, discrimination visual reaction time and prod learning time. No variables give correlations of this magnitude for contemporary deterioration alone.

The implications of the above relationships for the understanding of deterioration, the light which the present findings throw on some previously proposed measures of deterioration and the suggestions which arise from the study for the construction of prognostic devices of deterioration in schizophrenia are considered. [15 min., slides.]

9:40 A.M. *A Laboratory Method for Diagnosing Manic-Depressive Depression.* EDWARD I. STRONGIN, College of Medicine, Columbia University and LELAND E. HINSIE, New York State Psychiatric Institute and Hospital, New York.

In a previous report it was shown that the parotid gland secretory rate of patients with manic-depressive depressions was lower than that of the lowest "average normal" individual. The present investigation set out to determine if this low rate was found in all types of depressions or whether it was characteristic of only the manic-depressive depressions. A preliminary study on 50 cases was reported. This is a continuation of the investigation on an additional group where all the tests were performed by a technician as a part of the routine in the New York State Psychiatric Institute.

The findings can be summarized as follows: (1) Parotid gland rate determinations were made on a series of undifferentiated depressions before they were clinically studied. If the readings were below an average of .01 cc. per five minutes over a test of a half hour duration the depression was recorded tentatively, in the experiment records, as a manic-depressive depression. No other differentiation was attempted. The results were then filed away for comparison with clinical diagnosis. (2) The clinical diagnosis in each instance was later made by two psychiatrists working independently. The diagnosis of the two psychiatrists were then compared. When an agreement on the diagnosis occurred, the case was included for report in this communication. These clinical diagnoses were then compared with the laboratory diagnoses based on the parotid secretory rate. (3) It was found that the laboratory diagnosis based on the parotid gland determination offered a quick objective means of making a diagnosis. (4) The parotid secretory rate is inhibited in the very early stages of the disorder before it is possible to make a definite diagnosis of manic-depressive depression by the usual psychiatric procedures. (5) Secretory inhibition prevails during the daily mood fluctuations of the patient but the rate does return to the normal range when the patient recovers from the depression. (6) The rise of the secretory rate when the depression abates may be very sudden. (7) The parotid secretory test can be accomplished within an hour with simple inexpensive apparatus, involving little technical training. [15 min., slides.]

10:00 A.M. *A Study of the Use of Recent Memory Tests in the Measurement of Intellectual Deterioration.* S. MEDFORD WESLEY, Yale University.

In order to determine the extent to which objective tests of recent memory might be used as an aid in the diagnosis and measurement of intellectual deterioration, a battery of seven recent memory tests was devised. The series consisted of tests making use of blocks, objects, a story, paired associates, photographs of faces, color order reconstruction, and a figure-ground test. The series required 30 minutes' administration time. The average intercorrelation of the seven tests was $+ .30$.

This battery of memory tests along with the Stanford-Binet Vocabulary test (1937) was given to a group of 50 patients with diagnoses of or-

ganic brain disease of types generally believed to involve intellectual deterioration, and to a group of 50 normal control cases matched with the deteriorates on the basis of age, education, and occupational level.

The scores on the sub-tests were weighted according to the extent to which each of the tests discriminated the two groups of subjects. In order to take into account the factors of age and former general intellectual level in interpreting the score on the memory test as a whole, the multiple regression equation for the total memory test score on age, grade level, and vocabulary was computed for the control group. The discrepancy between the predicted memory test score and that actually obtained was then determined for each of the 100 subjects. Taking this discrepancy as a measure of deterioration, it was possible to set a critical score such that the deteriorated cases could be differentiated from the control subjects with an accuracy of better than 95%. The data also showed significant differences between certain of the diagnostic sub-groups of subjects. [15 min.]

10:20 A.M. *Wechsler-Bellevue Test Results in Senile and Arteriosclerotic Patients.* A. I. RABIN, New Hampshire State Hospital.

Wechsler's list of tests which do and do not hold up with age is largely based upon cursory observation since his standardization data did not include norms for the older age ranges (60+).

The present study attempts to check the test-score pattern in senility as such and compare it with the pattern observed in patients with cerebral arteriosclerosis in whom there is evidence of "interference with cerebral circulation."

Our data was obtained from 84 records on patients between the ages of 60 and 80. Thirty-seven of this group were sclerotic.

The following tentative conclusions seem to be warranted: (1) The object assembly and picture completion tests, contrary to Wechsler, do not hold up with age. (2) Arithmetic and memory for digits are more affected in arteriosclerosis than in the other senile conditions. (3) The arteriosclerotic group shows a comparatively well-preserved "abstract" (Goldstein) approach as evidenced by the results on the block design and similarities tests. [10 min., slides.]

10:35 A.M. *Audiogenic Seizures Elicited in Rats by Tones of Low Frequency.* CLIFFORD MORGAN and ROBERT GALAMBOS, Harvard University.

It has previously been shown that pure tones can elicit audiogenic seizures in rats, but that high frequencies in the neighborhood of 20,000 cps are more effective than low ones. The threshold of audibility has also been shown to be lowest at these high frequencies. One might expect, therefore, that the elicitation of seizures is a function of intensity above the rat's threshold of hearing. This hypothesis was attacked in the present experiments by studying seizures elicited at low frequencies.

Pure tones of low frequency (500 to 10,000 cps) and high intensity, it was found, elicit from rats typical audiogenic seizures after a latent period of about 45 seconds. In every respect the behavior is like that following

stimulation with keys, air-blasts, etc. The effectiveness of the different tones varies; 4000 cps is most effective (14.9 per cent), 500 cps is next (6.7 per cent), but no pure tone is as effective as noises with high-frequency components (*i.e.*, keys). Considering these results in relation to the acoustic intensities at which they occurred and to the rat's auditory threshold at different frequencies, one can draw the conclusion that sensation-level, not frequency, is the important aspect of the stimulus for eliciting epileptoid behavior in rats.

Further experiments with steady vs. interrupted tones (4000 cps) gave the following results. Interrupted tones ($\frac{1}{4}$ sec. on, $\frac{1}{4}$ sec. off) are as effective as steady tones, but increasing the silent period ($\frac{1}{4}$ sec. on, $\frac{3}{4}$ sec. off) reduces the number of seizures obtained. The latent period before the epileptoid behavior appears is the same, however, regardless of whether the tone is interrupted or steady.

These two experiments, together with other findings, lead to a general theory of the neural processes underlying the seizures. [15 min., slides.]

10:55 A.M. *The Relation of Audiogenic Seizure to Blood Cholesterol, Sugar, Protein, and Opacity.* OLIVER L. LACEY, Cornell University.

Reports in the psychiatric literature indicate that mental disorder is dependent in some degree upon blood composition. The striking similarity of the behavior of the rat during audiogenic seizure to certain psychotic symptoms suggests that susceptibility to seizure may likewise be a function of the constitution of the blood.

An investigation of this possibility was undertaken by comparison of seizure-susceptible and non-susceptible animals with respect to level and variability of blood cholesterol, sugar, protein, and red cell concentration.

The results point to three differences in level of blood constituents between the two groups of animals. The susceptible animals were higher than normal in blood sugar and red cell concentration, and lower in total protein. The groups differed in variability with respect to cholesterol, sugar and protein. In each of these three substances the variation of the seizure-susceptible animals was greater than that of the non-susceptible group. The significance of these results will be discussed. [15 min., slides.]

11:15 A.M. *The Effect of Electroshock Therapy on "Interference" in Memory.* JOSEPH ZUBIN, New York State Psychiatric Institute and Hospital.

In a previous study we reported that the saving method shows no retention while the recognition method shows almost unimpaired retention after shock. In order to examine the discrepancy between these two methods a study of the interference effect was undertaken. Paired associates (household commodities paired with pseudobrand names) were taught before shock and again after shock and direct interference was introduced by utilizing the same commodities each time. Under control conditions the interference is marked and we had expected that when shock is interpolated the interference would disappear. Instead it was accentuated. Our tentative conclusion is that electroshock treatment disorganizes but does not destroy the memory traces.

The author wishes to acknowledge the assistance of Nancy Newbert and R. F. Hefferline. [10 min., slides.]

RORSCHACH

Saturday, September 5, 9:00 A.M.

Parlor C

WAYNE DENNIS, Chairman

9:00 A.M. *Stability of the Personality Structure.* S. J. BECK, Michael Reese Hospital and Northwestern University.

This investigation is concerned with the problem of permanence or fluidity of personality structure in adults. Personality patterns were studied in individuals examined more than once with the Rorschach test, and observed clinically over periods of time. Distribution: shock treatment in schizophrenia, nine patients, 20 Rorschachs; in other conditions, eight patients, 17 Rorschachs; without shock but receiving adjustive therapy from psychiatrists or psychiatric social workers, 18 patients, 40 Rorschachs. Among the latter are included (a) extreme manic excitement and depressed states (one patient); (b) before outbreak of schizophrenia and in the psychosis (two patients); (c) in the psychosis and later in remission; (d) neurosis; (e) before psychoanalysis and in an interrupted phase of it in an adult of very superior level. Total: patients, 35; Rorschachs, 77. Intervals between Rorschachs ranged from eight days to 30 months. Ages: from 15 years, 5 months; only six were under 20.

Results: except in the manic-depressive case, main outlines of the Rorschach patterns are always recognizable as belonging to the same individuals but there are always changes in important features. E.g., following shock, most patients improve in intellectual control, usually at the cost of richness in mental life (impoverished content, reduced productivity, less affect and fantasy expression). The changes are thus at the "periphery" rather than the "core" of the personality. The two Rorschachs of the manic depressive patient were as from two totally different persons.

Conclusion: the personality at the ages indicated follows permanently grooved-out channels. Even such dramatic treatment as shock does not refashion it basically. [15 min., slides.]

9:20 A.M. *The Effect of Morphine upon the Rorschach Pattern in Post-addicts.* RALPH R. BROWN, United States Public Health Service Hospital, Lexington, Kentucky.

The Rorschach Test was administered under morphine and non-morphine conditions to 22 drug addict patients who had been abstinent from morphine for at least six months. Patients were in good physical health and of average intelligence. Morphine was administered in amount sufficient to produce a satisfactory psychological state as judged by the individual subjects. The average dose was 34 milligrams, with a range from 15 to 70. It was found that the Response Total, Details, Rare Details, and Human Movement Responses were increased. Responses to

color were also slightly increased, but the *erlebnistypus* shifted in the direction of introversion. Neurotic signs were reduced by morphine. Signs of intellectual control, organizational energy, and originality were not affected. It therefore appears that under morphine the personality of post-addicts changes in the direction of introversion in the sense of increased fantasy living, with attention being directed toward inner more than to outer stimuli. [10 min., slides.]

9:35 A.M. "*Signs, "Syndromes," and Individuality Patterns in Rorschach Reactions of Schizophrenics.*" BRUNO KLOFFER, Teachers College, Columbia University, and L. CLOVIS HIRNING, Grasslands Hospital, Westchester County, New York.

During the last five years various attempts were made to facilitate a clinical diagnosis based on the Rorschach reactions of various clinical subjects through the use of "signs," *i.e.*, Rorschach characteristics, which occurred significantly more frequently in a specified group of clinical subjects than in any control group.

Five such "sign" patterns have been published and discussed in the literature: organic, neurotic, schizophrenic, general maladjustment and general adjustment "signs." These five "sign" patterns were applied to the Rorschach records of 20 diagnosed schizophrenics, 10 of whom were paranoid schizophrenics and 10 catatonic or hebephrenic schizophrenics.

The possibilities and limits of the "sign" approach are discussed in the light of the results of this application. An attempt is made to determine what qualitative Rorschach elements beyond the traditional "signs" in these records are characteristic for schizophrenics in general and for the two sub-groups in particular. The term "syndrome" is proposed for these Rorschach elements parallel to the clinical use of this term.

A detailed comparison of the Rorschach findings with the case history and clinical observations tries to establish to what extent the presence of "signs" or "syndromes" depends on the individual personality constellation. [15 min., slides.]

9:55 A.M. *The Development of a Group Rorschach Technique in a Federal Penal Institution, With Special Reference to the Problem of Psychopathic Personality.* ROBERT M. LINDNER, KENNETH W. CHAPMAN, and EDWARD C. RINCK, United States Public Health Service Hospital, United States Penitentiary, Lewisburg, Pennsylvania.

The purposes of the present study were two-fold. The first aim was to survey the possibilities of the group Rorschach method as an instrument for preliminary screening of large groups of admissions to Federal penal institutions, in order to eliminate from time-consuming procedures those who do not require special attention. The second aim was to seek out critical factors in the Rorschach patterning of *psychopathic personalities*.

Because of the special circumstances under which Rorschach examination of inmates is conducted, and because of the personalities of such testees, the method as it developed differs considerably from other group techniques. It places greater responsibility upon the examiner than do

current methods, and it introduces a number of novel factors, among which are an "orientation blot" and the rotation of slides. Instructions for preparation of experimental accessories are included, and experimental procedures outlined.

Reliability studies were made for each Rorschach variable that appeared in sufficient frequency to allow of statistical treatment. Correlation coefficients obtained illustrate the feasibility of substituting the group for the individual method of Rorschach testing in penal institutions such as the one in which these studies were made. This is supported by observed similarities between the records so far as clinical impression is concerned.

To the moment of writing, the search for critical factors to distinguish psychopaths from normal subjects has been unrewarding. Trends, however, are apparent, and because of this the scope of the research has been extended. [15 min., slides.]

10:15 A.M. *The Validity of the Rorschach Group Method.* MARGUERITE R. HERTZ, Western Reserve University.

An experiment is in progress at the Brush Foundation to convert the Rorschach Method into a practical, reliable, and valid group method. The test has been administered individually and as a group technique by means of lantern slides to two classes of college girls, 73 subjects to date. Report has been made elsewhere on the technical aspects of group procedure. The present paper discusses results on validity.

Validity is judged by the extent of agreement between group and individual records and by the success of the group test in distinguishing the more neurotic, unstable, inhibited, and anxious types of personality.

Scores based on formulae developed for various traits,—intellectual control, stereotype-originality, combinative, abstractive and generalizing ability, analysis-synthesis, control-spontaneity, emotional stability, extratensive adaptability, extratensiveness-introversiveness, and dilation-constriction—tend to fall in similar ranges for individual and group tests. Profiles of adjusted and maladjusted types of personality likewise show high percentage of agreement. Thus anxious personalities revealed by individual tests are likewise shown by group tests. In the former, however, there may be 8 indicators while in the latter, only 5. Finally, total personality pictures developed independently from individual and group records show agreement in many general traits of personality.

Thus preliminary results with college girls warrant the expectation that certain important aspects of personality can be revealed in a group record. The group technique can classify college girls according to dominant personality traits and can differentiate the more neurotic, anxious, richly expansive and controlled personality. Group results cannot be viewed as unequivocal determination of the subject's personality, however, but only as a rough characterization. Where gross deviations are revealed, an individual examination can be given and the more subtle and finer nuances of personality ascertained. [15 min., slides.]

10:35 A.M. *Influence of Time Factor on Rorschach Performance.* EDITH WEISSKOPF, Briarcliff Junior College.

How does pressure of time affect Rorschach performances? The Rorschach was given to each subject once under normal conditions, once with exposure only ten seconds for each card.

The personality revealed by the short Rorschach differs from the one revealed by the long Rorschach: The form per cent decreases with the short method. Also most other changes move towards more implusiveness with the short method. There are three possible interpretations of the results: (1) The short Rorschach gives a truer personality picture, eliminating forced, artificial responses (most of which are form responses). (2) The two methods reveal different layers. The short method reveals the deeper layer, appearing only under pressure. The comparison enables prediction of a subject's reaction to pressure, thus filling an urgent need in selecting service men. (3) The far-reaching changes produced by different timing limit the validity of the Rorschach method. [10 min., slides.]

CELEBRATIONS

CELEBRATION OF THE CENTENARY OF THE BIRTH OF WILLIAM JAMES

September 2, 1942: 8:00 P.M.

Memorial Hall, Harvard University, Cambridge

JAMES R. ANGELL, Chairman

R. B. PERRY: James, the Psychologist: the Philosopher's View

E. L. THORNDIKE: James' Influence on the Psychology of Perception
and Thought

G. W. ALLPORT: The Productive Paradoxes of William James
Brief Reminiscences by Others

CELEBRATION OF THE SEMICENTENARY OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

September 3, 1942: 8:00 P.M.

Memorial Hall, Harvard University, Cambridge

C. E. SEASHORE, Chairman

S. W. FERNBERGER: The First Fifty Years: 1892-1942

R. S. WOODWORTH: The Adolescence of American Psychology
Brief Reminiscences and Remarks by Others

EXHIBIT OF MANUSCRIPTS AND LETTERS OF WILLIAM JAMES

The HOUGHTON LIBRARY

the new easterly annex of the WIDENER LIBRARY

Harvard University, Cambridge

Open 9-5 daily, and also 7-8 on September 2 and 3
before the Celebrations in Memorial Hall

RESEARCH AND INSTRUCTIONAL FILMS

Wednesday, September 2, 1:15 P.M.

and

Friday, September 4, 1:15 P.M.

Ball Room Assembly

J. GARTON NEEDHAM, Chairman

Note: The showing of films will not be accompanied by verbal descriptions, since proper titles in the films will be adequate.

Adaptive Behavior in Golden Mantled Ground Squirrels. L. F. BECK, University of Oregon. (20 min.)

Cryptic Automatic Writing by a "Multiple Personality." P. L. HARRIMAN, Bucknell University. (15 min.)

Finger Painting: The Use of Plastic Materials by Young Children. L. J. STONE, Vassar College. (35 min.)

Learning in a 23 Year Old Boy After 17 Years "Isolation." DORIS TWITCHELL-ALLEN, Glendale, Ohio. (35 min.)

Matching and Sorting Performance by Rhesus Monkeys. BENJAMIN WEINSTEIN, University of Wisconsin. (20 min.)

ROUND TABLES

WEDNESDAY, SEPTEMBER 2, 1942, 4:00 P.M.

Psychology and the War, Panel I. LEONARD CARMICHAEL, Director, National Roster of Scientific and Specialized Personnel; Chairman, Division of Anthropology and Psychology, National Research Council; *Chairman*. Georgian Room. Among those who are expected to participate are: J. G. Beebe-Center, Chairman, Committee on Latin-American Psychology; W. V. Bingham, Chairman, Advisory Committee to the Adjutant General's Office on Classification of Military Personnel; C. W. Bray, Research Investigator, Committee on Human Aspects of Observational Procedures, National Research Council; K. M. Dallenbach, Chairman, Emergency Committee in Psychology; J. W. Dunlap, Director of Research, Committee on Selection and Training of Aircraft Pilots; S. W. Fernberger, Technical Aide, National Defense Research Committee; Lt. Colonel J. C. Flanagan, Army Air Forces; E. R. Guthrie, Chief Consultant Psychologist, Psychological Warfare Branch, Military Intelligence Service; Lt. Commander J. G. Jenkins, USNR, Bureau of Aeronautics; R. Likert, Head, Division of Program Surveys, Bureau of Agricultural Economics, Department of Agriculture; W. R. Miles, Committee on Selection and Training of Aircraft Pilots and Committee on Aviation Medicine, National Research Council; L. J. O'Rourke, Research Psychologist, U. S. Civil Service Commission; Major M. W. Richardson, Adjutant General's Office; C. L. Shartle, Chief, Occupational Analysis Section, U. S. Employment Service; R. C. Tryon, Chief, Psychology Division, Office of the Coordinator of Information; M. S. Viteles, Chairman, Committee on Selection and Training of Aircraft Pilots; R. S. Woodworth, Chairman, Committee on Child Development

THURSDAY, SEPTEMBER 3, 1942, 1:15 P.M.

The Activities of the Office of Psychological Personnel. STEUART H. BRITT, *Chairman*. Salle Moderne. Question and answer period.

THURSDAY, SEPTEMBER 3, 1942, 2:00 P.M.

Recent Trends in Psychology in the Latin-American Countries. J. B. BEEBE-CENTER, *Chairman*. Ball Room Assembly. Details to be announced. It is expected that the Round Table will include communications from a number of Latin American psychologists.

Symposium on Visual Fatigue. ROSS A. MCFARLAND, *Chairman*. Parlor A. Participants: Adelbert Ames, Leonard Carmichael, David G. Cogan, W. F. Dearborn, Alfred H. Holway, Walter Miles, Robert Thorndike, M. A. Tinker.

Some Psychological Problems of Training for Leadership in a Democracy. RONALD LIPPITT and L. K. HALL, *Co-chairmen*. Parlor B. Arranged by the Program Committee of the Society for the Psychological Study of Social Issues and the American Association for the Study of Group Work. The following are expected to participate: Alex Bavelas, Hedley

S. Dimock, L. M. Hanks, Jr., Robert Heininger, Kurt Lewin, Fritz Redl.

Recent Advances in Motivation. E. R. HILGARD, *Chairman*. Parlor C. Arranged by the Program Committee of the National Institute of Psychology. Participants: Robert R. Sears on *Secondary Motives and Personality* and Edward C. Tolman on *A Need Conversion Diagram*. (slides)

FRIDAY, SEPTEMBER 4, 1942, 4:00 P.M.

Psychology and the War, Panel II. KARL M. DALLENBACH, *Emergency Committee in Psychology, Chairman*. Georgian Room. Among those expected to participate are: Leonard Carmichael, *Chairman*, Division of Anthropology and Psychology; E. G. Wever, *Chairman*, Sub-Committee on Perceptual Problems; M. R. Trabue, *Chairman*, Sub-Committee on Learning and Training; S. H. Britt, *Chairman*, Sub-Committee on Listing of Personnel in Psychology; E. A. Doll, *Chairman*, Sub-Committee on Problems of Mental Deficiency; Ruth S. Tolman, *Chairman*, Sub-Committee on Service of Women Psychologists in the Emergency; G. W. Allport, *Chairman*, Sub-Committee on Defense Seminars; H. E. Burt, *Chairman*, Sub-Committee on Psychological Aspects of Readjustment; C. C. Pratt, *Chairman*, Sub-Committee on Psychological Research Projects; E. G. Boring, *Chairman*, Sub-Committee on Textbook of Military Psychology.

BUSINESS MEETINGS AND PRESIDENTIAL ADDRESSES

ANNUAL BUSINESS MEETING

OF THE

AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY

WALTER V. BINGHAM, *President*

TUESDAY, SEPTEMBER 1, 8:00 P.M.

GEORGIAN ROOM

ADDRESS OF THE PRESIDENT

AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY

*THE IRREPRESSIBLE CONFLICT BETWEEN
PRACTICE AND RESEARCH*

WALTER V. BINGHAM

WASHINGTON, D. C.

MONDAY, AUGUST 31, 7:00 P.M.

ANNUAL BUSINESS MEETING

OF THE

SOCIETY FOR THE PSYCHOLOGICAL STUDY OF
SOCIAL ISSUES

KURT LEWIN, *Chairman*

TUESDAY, SEPTEMBER 1, 8:00 P.M.

SALLE MODERNE

ADDRESS OF THE CHAIRMAN

SOCIETY FOR THE PSYCHOLOGICAL STUDY OF
SOCIAL ISSUES

PSYCHOLOGY AND THE TECHNIQUE OF GROUP LIVING

KURT LEWIN

UNIVERSITY OF IOWA

TUESDAY, SEPTEMBER 1, 9:00 P.M.

SALLE MODERNE

ANNUAL BUSINESS MEETING
OF THE
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
CALVIN P. STONE, *President*
THURSDAY, SEPTEMBER 3, 3:30 P.M.
GEORGIAN ROOM

ADDRESS OF THE PRESIDENT
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
*MULTIPLY, VARY, LET THE STRONGEST LIVE AND
THE WEAKEST DIE—CHARLES DARWIN*

CALVIN P. STONE
STANFORD UNIVERSITY
FRIDAY, SEPTEMBER 4, 8:00 P.M.
STATLER BALLROOM

ANNUAL BUSINESS MEETING
OF THE
PSYCHOMETRIC SOCIETY
PAUL HORST, *President*
THURSDAY, SEPTEMBER 3, 2:00 P.M.
PARLOR D

ADDRESS OF THE PRESIDENT
PSYCHOMETRIC SOCIETY
*THE TWILIGHT OF RUGGED INDIVIDUALISM
IN QUANTITATIVE PSYCHOLOGY*

PAUL HORST
PROCTER AND GAMBLE Co.
THURSDAY, SEPTEMBER 3, 7:15 P.M.

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PSYCHOLOGY AND THE WAR

STEUART HENDERSON BRITT, *Editor*

SELECTIVE SERVICE OCCUPATIONAL QUESTIONNAIRE

The general Occupational Questionnaire is now being sent out to thousands of registrants over the country by Selective Service Local Boards. Question Number 32 regarding professional and scientific workers should be of considerable interest to members of the psychological profession because of the inclusion of the word "Psychologist." This part of the questionnaire is reproduced below:

32. FOR PROFESSIONAL AND SCIENTIFIC WORKERS: Mark "X" before any occupation below in which you have had experience or training; if you are now working at one of these occupations, circle the number in front of it.

- | | | |
|--|--|--|
| 01 <input type="checkbox"/> Accountant. | 15 <input type="checkbox"/> Engineer, industrial. | 26 <input type="checkbox"/> Metallurgist. |
| 02 <input type="checkbox"/> Administrative official. | 16 <input type="checkbox"/> Engineer, metallurgical or mining. | 27 <input type="checkbox"/> Personnel manager. |
| 03 <input type="checkbox"/> Architect, naval. | 17 <input type="checkbox"/> Engineer, mechanical. | 28 <input type="checkbox"/> Physician. |
| 04 <input type="checkbox"/> Architect, other. | 18 <input type="checkbox"/> Engineer, radio. | 29 <input type="checkbox"/> Physicist. |
| 05 <input type="checkbox"/> Bacteriologist. | 19 <input type="checkbox"/> Engineer, refrigerating or air-conditioning. | 30 <input type="checkbox"/> Physiologist. |
| 06 <input type="checkbox"/> Biologist. | 20 <input type="checkbox"/> Geographer. | 31 <input type="checkbox"/> Psychologist. |
| 07 <input type="checkbox"/> Budget analyst. | 21 <input type="checkbox"/> Geologist or geophysicist. | 32 <input type="checkbox"/> Social worker. |
| 08 <input type="checkbox"/> Chemist. | 22 <input type="checkbox"/> Historian. | 33 <input type="checkbox"/> Sociologist. |
| 09 <input type="checkbox"/> Dentist. | 23 <input type="checkbox"/> Horticulturist. | 34 <input type="checkbox"/> Statistician. |
| 10 <input type="checkbox"/> Economist. | 24 <input type="checkbox"/> Lawyer. | 35 <input type="checkbox"/> Veterinarian. |
| 11 <input type="checkbox"/> Engineer, aeronautical. | 25 <input type="checkbox"/> Mathematician. | 36 <input type="checkbox"/> Other professional or scientific occupation. |
| 12 <input type="checkbox"/> Engineer, chemical. | | (specify) |
| 13 <input type="checkbox"/> Engineer, civil. | | |
| 14 <input type="checkbox"/> Engineer, electrical. | | |

Have you ever registered with the National Roster of Scientific and Specialized Personnel, Washington, D. C.?

- ☐ Yes. ☐ No. ☐ Don't know.

SELECTIVE SERVICE OCCUPATIONAL BULLETIN REGARDING SCIENTIFIC AND SPECIALIZED PERSONNEL

Occupational Bulletin No. 10 has just been released by the National Headquarters of the Selective Service System, dealing with the subject of "Scientific and Specialized Personnel." Because of its far-reaching implications for psychologists, this Bulletin appears below in its entirety:

OCCUPATIONAL BULLETIN (No. 10)

SUBJECT: SCIENTIFIC AND SPECIALIZED PERSONNEL

EFFECTIVE: IMMEDIATELY

DISTRIBUTION: STATE DIRECTORS

BOARD OF APPEAL MEMBERS

LOCAL BOARD MEMBERS

GOVERNMENT APPEAL AGENTS

PART I

1. There are certain persons trained, qualified, or skilled in scientific and specialized fields who, if engaged in the practice of their respective professions, are in a position to perform a vital service in activities necessary to war production and in activities essential to the support of the war effort.

PART II

1. The National Roster of Scientific and Specialized Personnel has certified to the Director of Selective Service that in activities necessary to war production and in activities essential to the support of the war effort, there are certain "critical occupations" which for the proper discharge of the duties involved require a high degree of training, qualification, or skill in scientific and specialized fields. The critical occupations in these scientific and specialized fields, as certified to the Director of Selective Service, are listed on page 4 attached to this bulletin.

2. All of these critical occupations, as listed, require highly specialized periods of training of two years or more. The critical occupations on the attached list exist within the provisions of Part V, Memorandum to All State Directors (I-405).

PART III

1. The National Roster of Scientific and Specialized Personnel has certified to the Director of Selective Service that there are serious shortages of persons trained, qualified, or skilled to engage in these critical occupations in activities necessary to war production and in activities essential to the support of the war effort. These shortages exist within the provisions of Part VII, Memorandum to All State Directors (I-405), and accordingly careful consideration for occupational classification should be given to all persons trained, qualified, or skilled in these critical occupations and who are engaged in activities necessary to war production or essential to the support of the war effort.

PART IV

1. There are many registrants who are in training and preparation to acquire the qualification or skill to engage in these critical occupations. Normally the period of training and preparation to acquire the necessary qualification or skill in these scientific and specialized fields extends over a period of four academic years in a recognized academic, professional, or technical college or university. In many instances, however, it is necessary for persons to have additional study in a recognized academic, pro-

fessional, or technical college or university in order to acquire the more highly specialized qualification or skill necessary for the performance of particular services in activities necessary to war production or essential to the support of the war effort. Persons engaging in further studies in addition to the four academic years normally required are referred to as graduate or postgraduate students.

2. A registrant who is in training and preparation for one of these scientific and specialized fields may not be considered for occupational classification until the close, or approximately the close, of his second or sophomore year in a recognized college or university.

3. A registrant who is in training and preparation for one of these scientific and specialized fields may be considered for occupational deferment at the close, or approximately at the close, of his second or sophomore year in a recognized college or university if he is pursuing a course of study upon the successful completion of which he will have acquired the necessary training, qualification, or skill, and if he gives promise of continuing and will be acceptable for continuing such course of study and will undertake actual further classroom work within a period of not to exceed four months from the close of his second year.

4. A registrant who is in training and preparation for one of these scientific and specialized fields shall be considered for occupational classification during his third and fourth years in a recognized college or university, provided that he gives promise of the successful completion of such course of study and the acquiring of the necessary degree of training, qualification, or skill.

5. A graduate or postgraduate student who is undertaking further studies for these scientific and specialized fields, following the completion of the normal four academic years, may be considered for occupational classification if, in addition to pursuing the additional studies, he is also acting as "graduate assistant" in a recognized college or university or is engaged in scientific research related to the war effort and which is supervised by a recognized Federal agency. A graduate assistant is a student in postgraduate studies who, in addition, is engaged in the teaching and instruction of undergraduate students in these scientific and specialized fields.

6. When a registrant has completed his training and preparation in a recognized college or university and has acquired a high degree of training, qualification, or skill in one of these scientific and specialized fields, such registrant should then be given the opportunity to become engaged in the practice of his profession in an activity necessary to war production or essential to the support of the war effort. In many instances following graduation from a recognized college or university, a certain period of time will be required in the placing of trained, qualified, or skilled personnel in an essential activity. When a registrant, has been deferred as a necessary man in order to complete his training and preparation, it is only logical that his deferment should continue until he has an opportunity to use his scientific and specialized training to the best interest of the nation. Accordingly, following graduation from a recognized college or university in any of these scientific and specialized fields, a registrant should be con-

sidered for further occupational classification for a period of not to exceed 60 days in order that he may have an opportunity to engage in a critical occupation in an activity necessary to war production or essential to the support of the war effort, provided that during such period the registrant is making an honest and diligent effort to become so engaged.

LEWIS B. HERSHEY, *Director*

LBH/phw

DISTRIBUTION "A, B, C, D, E, F"

CRITICAL OCCUPATIONS

SCIENTIFIC AND SPECIALIZED PERSONNEL

Accountants

Chemists

Economiats

Engineers:

Aeronautical Engineers

Automotive Engineers

Chemical Engineers

Civil Engineers

Electrical Engineers

Heating, Ventilating, Refrigerating, and Air Conditioning Engineers

Marine Engineers

Mechanical Engineers

Mining and Metallurgical Engineers, including Mineral Technologists

Radio Engineers

Safety Engineers

Transportation Engineers—Air, Highway, Railroad, Water

Geophysicists

Industrial Managers

Mathematicians

Meteorologists

Naval Architects

Personnel Administrators

Physicists, including Astronomers

Psychologists

Statisticians

Psychological Bulletin

RORSCHACH: TWENTY YEARS AFTER¹

BY MARGUERITE R. HERTZ

Western Reserve University

This is not the first historic crisis of humankind. But it is the first which so directly and immediately affects so many millions of men and women. Never before has crisis had such far-reaching involvement, for never before has war been "total." The precarious balance in which we find the mental health and well-being of men and women is probably without historical counterpart, for today there can be no refuge, no escape, and no isolation.

Behind the all-pervading economic turmoil, emotional panic, moral bankruptcy, and social disintegration of our times lie intellectual confusion, tension, frustration, and instability, and their broods of conflicts and contradictions. For us whose work is related to the maintenance of sanity and health, the hour is charged with responsibility; and no meeting of psychologists and psychiatrists today can be free from earnest self-searching.

Such a *milieu* makes it both fitting and inevitable that this twentieth milestone in the history of the Rorschach Method should be devoted to an examination of our tools, an evaluation of their achievements, and a study of their potentialities in the light of the psychological and psychiatric needs of the moment. What called them into being? What has been done with them? How well have they been used? How keen are their cutting edges? How can they be made even keener?

To understand the Rorschach Method, it seems necessary to picture the background of its birth—a birth of peculiar interest to us today, because it was born of revolt in the world of psychological thought.

The atomistic conception of personality had met with challenge. Personality as a bundle of characteristics, each subject to identification, segregation, and measurement and together forming

¹ Paper read in part as the presidential address at the annual meeting of the Rorschach Institute, April 17, 1941, Columbia University, New York City.

a whole which was merely the sum of its parts, encountered resistance. The newer disciplines—Gestalt psychology, Psychoanalysis, Typology, Psychodiagnostics, and the Psychology of *Verstehen*, postulated personality as more than the sum total of assembled static qualities and rather as a living, functioning whole, a dynamic synthesis.

Thus was formulated a new approach to the study of personality. The problem of how to study a synthesis rather than a conglomeration of isolated parts still remained, for both research and practice had made it clear that personality possessed aspects which eluded the stereotyped and conventionalized paper-and-pencil tests, the questionnaires, the rating scales, and laboratory techniques of measurements.

There ensued a quest for the elusive which opened new avenues and forged new tools. Projective techniques were developed so that today many students of personality no longer rely exclusively upon answers to questions or on minute reactions elicited in the laboratory routine. Nor do they judge the individual solely by comparing him with his fellows.

They prefer to place the individual in a specific situation, presenting him with words, unfinished sentences, plastic materials, puppets, pictures, or ink-blot, and study what he does. Conduct in specific situations now dominates the attention of these students of personality. They evaluate the individual in terms of himself, knowing that mental, emotional, and experiential equipment and background will lead him to react in his unique way. His reactions will yield an insight into his mental processes, fantasy life, desires, emotionality, talents, and the like and thus permit us, by their revelations and projections, to reconstruct his personality (Frank, 81, 82; Updegraff, 345; Horowitz and Murphy, 329; Grimes, 327).

Thus armed with approach and method, we found ourselves confronted with the problem of evaluation. The classical dilemma of objectivity *vs.* subjectivity still challenges us. Will quantitative method permit of application to qualitative subject matter? This is a question which, although not fully answered, has produced during the last decade efforts to combine and interweave the experimental and the intuitive attitudes toward personality (Spearman, 340; Vernon, 346; Allport, 318; Dashiell, 60).

Rorschach was the father of no new discipline. He formulated no specific theory. But his procedure was such as to leave little doubt that to him personality was a functioning unit. His early

monograph (251) presented a psychogram which portrayed personality as a complex structure of constituent patterns in dynamic union; and in such a union it was inevitable that change in one process should be accompanied by change in others.

Thus Rorschach, swept along by the revolt against atomism, must have conceived of personality as determined ultimately by the organization, interplay, and uniqueness of those constituent patterns which represented for him dynamically interrelated mental processes. As the creator of the ink-blot method of personality diagnosis, he pioneered in the development of projective techniques (293), and his method inspires us to perfect a synthesis of the experimental and the intuitive attitudes toward the study of personality.

Rorschach, however, has not escaped the skeptics. Many students of personality, temperamentally opposed to prosaic ink-blot as media of personality expression, uncritically resist the method. Personality is a sacred thing, closely associated with human dignity, and there should be no surprise in discovering that there are those to whom it is offensive to think of ink-blot as oracles of the soul. To them, human personality is too rich, too variegated, and its manifestations too subtle and too devious to permit of revelation by meaningless ink-blot.

Others believe that the Rorschach Method involves the dangers inherent in permitting the specific to cast too much light on the general. Among them are those who, guided by the old psychology with its emphasis on the dependence of sensation on specific stimuli, insist that a method based solely on *visual* perception can reveal only one aspect of personality. They fail to understand Rorschach's concept of interpretations of the blot as "apperceptions," determined not only by physical causes but even more by the psychological "structure" of the individual at the time, depending upon his experiences, emotions, attitudes, and mental set (Schachtel, 263; Hunter, 137).

And also among the skeptics are those for whom it is difficult to believe, despite their eagerness for a new method of personality study, that specific phases of the personality revealed in certain limited situations can be relied upon to represent personality in general (Allport, 318). Among them, the Rorschach response picture is not accepted as a projection of personality in its characteristic mental and emotional potentialities.

On the other hand, many students of personality have come to

believe that promising possibilities are inherent in the Rorschach technique. With the passing of years, their number has increased so that "Rorschach" has become a familiar term in the idiom of psychologists, psychiatrists, counsellors, teachers, social workers, and even judges—in fact, among nearly all who treat human beings and their personality problems. In the last decade, hardly a book, article, or review pertaining to personality in any language or in any country omits mention of the Rorschach technique (Allport, 318; Bailey, 9; Blackburn, 34; Biäsch, 28; Braunshausen, 48; Burks and Jones, 325; Burt, 53; Frank, 81, 82; Greulich, *et al.*, 92; Graf, 90; Guilford, 93; Kretschmer, 183; Stagner, 341; Watson, 304).

Rorschach grows ever in influence at such a pace that keeping abreast of the literature would become burdensome but for the aid of a number of bibliographies (Vernon, 298, 299, 300, 301; Binder, 30; Hertz, 114; Piotrowski, 235; Guirdham, 94; Krugman, 184). Study has been promoted and fostered by the use of centers of teaching and research. Such centers include those under the leadership of Schneider, Binder, Skálweit, Loosli-Usteri, and Monnier, to mention a few who are (or were) active in continental Europe; Guirdham and Vernon in England; and an ever-increasing number in the United States—Oberholzer, Levy, Wells, Klopfer, Piotrowski, Kelley, Rickers, and Beck, and our own center at Western Reserve University. And the Rorschach Institute, through the *Rorschach Exchange* which it now fosters, has helped to extend the scope of the method and to offer opportunity for its refinement, development, and, what is most important, periodic evaluation (154).

Probably no topic, however, is so provocative to "Rorschachers" and so inviting to discussion and debate as the problem of standardization. The very word arouses partisanship (if "partisanship" may be used to describe scientific differences). At one extreme stand those who resent such a term when applied to our instrument of "art" and who reluctantly suggest that, if some such concept must be entertained, let it be named "refinement" or "rationalization," to avoid the stigma of rigid "schematization" (Klopfer, 171). At the other are those to whom standardization is our most important task (Beck, 17, 18; Hertz, 120, 123). Both positions have received extensive attention, and papers have been published by Klopfer (171), Frank (80), Hertz (123), Shuey (276), Klopfer, Krugman, Kelley, Murphy, and Shakow (176), while the latest symposium has been summarized by Miale (204).

Hence, at the risk of heresy, I propose to devote myself to the thought that standardization is no longer debatable, that to the extent that it is either possible or desirable, standardization is the outstanding feature of the 20 years since Rorschach. I propose to content myself with a brief survey of our progress toward standardization and toward the establishment of reliability and validity. But, again risking heresy, I emphasize, I do not mean standardization in either the sense of rigidity or inflexibility. I use the term because our emphasis has been upon the development of our method as an art at the expense of those considerations which, in the last analysis, would place the Rorschach Method within the bounds of reliability and practicability. If, in this brief survey, I emphasize certain studies and overlook others, it is only because preference has been given to systematic treatments and to studies with research orientation.

ADMINISTRATION AND SCORING

Both in the administration of the method and in the scoring of responses, standardization has made rapid and forward strides. These have come in response to the desires of workers for aid, support, and reinforcement which cannot be made available without standardization.

A desire for certainty and precision in procedure has nurtured a demand for published instructions. Rorschach's original monograph has been reissued in new editions (251). Included now in the monograph is Rorschach's second article on the application of the method to psychoanalysis, published posthumously by Oberholzer. Unfortunately, no translation of the original study has ever been published, and it is still unknown to many workers in the field.

In the course of the years, other workers have described the method, some with more and some with less detail (Apolczyn, 6; Beck, 12; Bratt, 47; Piotrowski, 234; Loosli-Usteri, 190; Hertz, 114, 115, 116, 128; Klopfer, 165, 166, 167; Hunter, 137; Dubitscher, 69, 70, 71; Löpfe, 192; MacCalman, 193; Mandowsky, 197; Rizzo, 247; Monnier, 207; Salas, 257; Soukup, 281; Schneider, 268; Vernon, 298). Three manuals have appeared in recent years, in French by Loosli-Usteri (161, 191), in German by Schneider (269), and in English by Beck (21). Beck's manual, the first book to be published in English, marks an important step forward, since it is the first to emphasize the objective-standardized approach to the method and call a halt to the exclusive reliance on personal norms and subjective estimate.

The series of articles by Vernon (298, 299, 300, 301, 302), Guirdham (94, 95, 96, 97, 98, 99), and Monnier (207, 208) have made the method accessible to larger numbers while the work of Klopfer, Piotrowski, Kelley, and other members of the New York research groups (164-180) have given probably the most extensive accounts with the most detailed illustrative material. The studies of the Brush Foundation and the Western Reserve University Department of Psychology, I should like to believe, have contributed at least in a measure to a better acquaintance with a more precise procedure (Hertz, 113-133).

A desire for accurate, extensive, and complete records has inspired more efficient methods for recording data, summarizing information, and developing techniques to yield greater help in interpretation. These include, for example, symbols (Beck, 21), mimeographed blot outlines (Vernon, 298), miniature blot photographs (Klopfer and Davidson, 174), and code charts (Hertz, 116; Fleischèr and Hunt, 78), all of which are devised to expedite administering the test and scoring the results (Hertz, 128).

A desire for a systematic form of questioning to elicit essential information has led to the development of the "systematic inquiry" which embraces a discussion of responses, conspicuous omission of details and determinants of responses, and includes a procedure of "probing" or of what Klopfer calls "testing the limits" by provoking additional responses to determinants not used in the performance proper (166). It should be noted that at no time have questions themselves been rigidly standardized. Along with a minimum of uniformity, emphasis has been placed on natural conversation and flexibility of approach.

Important advances in the direction of standardization have likewise been made in the scoring. The desire to provide inexperienced workers with guides (Klopfer, 171; Hirning, 176; Hertz, 123; Beck, 21), to eliminate the problem of the personal equation (Kelley, 175), to make the test available as an instrument of research (Hertz, 123), to permit of coöperative projects among examiners by making possible comparisons of material obtained by several investigators (Klopfer, 171; Hertz, 123), and to increase the reliability and validity of the method (Beck, 17, 24; Hirning, 176; Hertz, 123) has induced a modification of the stress on subjective estimate and "empathy" (Bleuler, 38; Wells, 306; Benjamin, 26) by efforts to develop objective criteria for the various scoring categories (Beck, 18, 20; Hertz, 123, 125).

Hence, after extensive study (3, 4, 5, 245), many Rorschach factors have been elaborated, others altered, a few discarded, and still others more clearly defined and differentiated (Vernon, 298, 299; Guirdham, 94; Beck, 17, 21; Meltzer, 202; Loosli-Usteri, 191; Hertz 118-122, 124; Monnier, 207, 208; Thornton, 289; Just, 150; Rickers, 244; Schachtel and Hartoch, 264; Sender and Klopfer, 271; Piotrowski, 228; Klopfer, Burchard, *et al.*, 173). Probably the most extensive refinement of the scoring system has been introduced by Klopfer and the New York research groups (59, 165-180). Frequency tables have been published for certain Rorschach categories (Beck, 21; Loosli-Usteri, 191; Hertz, 117), and percentage charts prepared to expedite the work of scoring (Hertz, 127). The Brush Foundation has concerned itself especially with the problem of the scientific determination of scoring criteria (118-122). The need for precise formulations has been emphasized by Beck (24), who would resort to operationism recommending operational definitions of the criteria upon which responses are classified.

Another phase of the scoring which has received some attention has been the significance of the Rorschach factors in relation to the specific cards in which they occur. While Rorschach presented each card as having its own unique propensity to elicit certain factors, as W, D, M, or C, this principle has not been systematically established. Empirical evidence has been advanced by Klopfer, *et al.* (173) and Booth (43), and statistical studies have been presented by Beck (15) for the W, and by Hertz and Kennedy (132) for the movement factor. Systematic studies of other factors according to age level would contribute, of course, to the further standardization of the method.

Many investigators have developed and differentiated the original Rorschach factors further and have added new factors. "Z, FY, and Y" have been introduced by Beck (15, 21), "g" by Vernon (299), another "g" by Hertz (132), "v" by Rickers and Klopfer (246), FM and m by Klopfer (174, 175, 179), Piotrowski (228), and Booth (41), *M* and *m* by Hertz (120), F (Fb) and F hd, hd F and hd by Binder (30-32, 111), c and K alone or in combination with Form by Klopfer and the New York research groups (165-168, 173-175), Hertz (124), and Schneider (270), B Di (balanced richness of personality) by Meltzer (202), subject and object criticism by Frankel and Benjamin (83), concepts of "sequences," "psychic phases," and "curves of reaction" by Schachtel and Hartoch (265), and the "social personality" by Beck (16, 21).

For the most part, such work has given to the scoring that refinement and objectification so necessary to reliability. Unfortunately, many of the factors introduced have only been empirically established and hence supported by no systematic proof. Many of them, it is true, promise to foreshadow in importance some of the original categories. But many contend, with justification, that while blind diagnosis and clinical hypotheses are helpful in revealing new patterns not previously included in the scoring system, they must be followed by systematic study to establish their true significance, especially before they are included in a scoring system used in clinical diagnosis and research studies (Beck, 20; Hertz, 119, 123, 125). It is to be hoped that in the next few years adequate experimental and systematic clinical proof will be produced defining the new categories clearly, showing them to be psychologically significant, and justifying their inclusion in a valid scoring system.

It must be emphasized, however, that while we have moved toward standardization in the scoring of the method, it has not been a standardization of rigidity. Objective criteria have been employed with caution, few examiners losing sight of the total picture of which the factors are but a part. The scoring still remains a matter of skill—"art" if you will, but the "art" has not been without form and direction.

INTERPRETATION

Thus, while standardization has made its way in no uncertain strides both in giving the test and in scoring the answers, the problem of interpreting the scores still eludes the advocates of standardization.

But, even in this direction, efforts have been made. Of course, no rigidly standardized procedure of interpretation has been, or can be, prescribed because of the essential nature of the method. Warnings against such rigidity of procedure have been sounded again and again (Murphy, 176; Kelley, 175; Beck, 13, 14, 16, 19; Klopfer, *et al.*, 171, 173; Hertz, 123; Marseille, 204; Frank, 80). But, while it is generally appreciated that Rorschach patterns for an individual fall into a whole, consistent only for that unique individual, and that the manipulation of these patterns depends not on any standardized scheme but upon the training, skill, and intuitive sense of the interpreter, workers in the field have developed a systematic approach to the procedure and have written on both theory and technique of interpretation.

Innumerable case studies in the literature demonstrate this procedure (Piotrowski, 227, 229, 234; Miale, Clapp, and Kaplan, 205; Wolfson, 307; Tallman and Klopfer, 288; Klopfer and Miale, 178). In addition, the three manuals and various articles contain copious illustrations and recommendations. Oberholzer suggests, for example, starting the interpretation with patterns of affectivity; Monnier, Löpfle, and Hertz prefer to estimate intelligence; Beck, Piotrowski, and Loosli-Usteri choose to examine all unusual patterns first.

Probably the most extensive treatise on the theory and technique of interpretation, however, is that of Klopfer, Burchard, Kelley, and Miale (173). They outline what, in flight from the word "standard," they call "a rational structure in procedure" which includes an analysis of the sequence of each response, a "blind diagnosis" based on the relationship among the patterns and on their "personality Gestalt," and a final analysis in terms of other clinical and test data. Most authorities pursue a similar procedure including an analysis of the frequency, the sequence, and the reciprocal relationships of the Rorschach patterns.

It should be noted that in the interpretation, two things are of interest to the Rorschach examiner: how the individual stands in terms of his group and how he stands in respect to his own potentialities. Two approaches to the Rorschach data, then, are indispensable whatever the procedure of interpretation: the *intraindividual* and the *interindividual*. The former, the intraindividual, concerns itself with the patterning of the traits within the individual, how those traits are integrated among themselves without reference to the individual's group. What, for example is the role of intelligence in the total personality? How is extreme introversion balanced by inner living, or by intellectual control? How is the fantasy life balanced by a sense of reality? In a word, what is the intraindividual consistency of that individual?

The second approach, the interindividual, involves a comparison of the individual's response patterns with those of other individuals in his group. Now of interest is the relative strength of the individual's introversion in relation to his group, or the extent of his emotional stability, or the degree of mental control. While the first approach receives our greater attention, the second, despite its subordinate importance, must be recognized for what it is—a comparison which, of necessity, resorts to a norm, that *bête noire* of those who view the Rorschach procedure as an art.

Fortunately during the past decade, norms have been amassed for many age groups (21, 25, 70, 71, 72, 86, 87, 105, 115, 138, 162, 170, 190, 191, 192, 200, 201, 216, 258, 269, 287, 298, 299). These are available and summarized up to 1939 by Davidson and Klopfer (61, 62). But there are still striking omissions and marked deficiencies in the material at our disposal (21, 125, 298). For instance, research in the establishment of norms has failed to keep step with our growing needs. Few norms are available for the younger age levels (72, 177, 220). "Experience" directs the interpretations in these age ranges. For the older groups, many norms presented have been based on small samples, without statistical evidence and without defining the groups (Hertz, 125).

In discussing norms, one does not sink to the "deadly level of psychometry" (98). Norms are a necessary part of the Rorschach Method and must be determined for different cultures, for various age groups, age ranges, mental age levels within these ranges, and possibly for developmental levels (Klopfer, *et al.*, 173; Beck, 21; Hertz, 125; Hertz and Baker, 126, 129-131). If no such norms are employed, the interindividual approach in the interpretation can have no scientific pretensions. Yet the use of such norms, to that extent at least, involves a standardization of the technique of interpretation.

On the other hand, it should be noted that the final analysis in the procedure of interpretation in terms of other clinical and test data defies standardization, as Rorschach originally contended. The information gleaned from the Rorschach material is projected against family background, education, training, health history, past life, qualitative judgments of the examiner and of other people, and other clinical and test data. This is then interpreted in terms of the examiner's experiential knowledge of the dynamics of human behavior. Final conclusions are made by inference and analogy depending upon the experience, ingenuity, the fertility of insight, and, not to be forgotten, the common sense of the examiner. Prolonged and extensive experience is necessary, not only with human personality but with all kinds of clinical problems (Klopfer, 171; Beck, 20, 23, 24; Piotrowski, 238; Kelley, 153, 176; Bratt, 47; Hertz, 119, 123). This last step by definition, therefore, is personal to the examiner and subjective in him. It permits of no norms, and it eludes all standardization.

RELIABILITY

Included in the movement toward standardization have been developments in establishing the reliability and the validity of the method.

Relatively few studies have concerned themselves with reliability. For the most part, many aspects of the problem have been uncritically assumed. Thus, the administration, the scoring system, the application of the method, its reference to special groups, the "skill" of the examiner, and the interpretation of the response record have been assumed to be reliable.

Only two articles show the scoring system to be sufficiently reliable (Hertz, 120; the Sichas, 277).

Troup (291), using the matching technique proposed by Vernon (302) has demonstrated the reliability of the method as a whole. Another "global" approach, based on a comparison of blind diagnoses of several interpreters, has been demonstrated by Hertz and Rubenstein (133). A statistical technique using the Chi Square Method has been advocated by Fosberg (79) to show the reliability of the Rorschach Method in revealing the permanent personality under varying conditions.

Results obtained from the split-half method are conflicting, though some investigators have obtained fairly satisfactory reliability for several of the Rorschach patterns (Hertz, 113; Troup, 291; Thornton and Guilford, 290). Their procedure has been censured, however, because of the atomistic approach in treating variables independently and isolated from their context. Nevertheless there is some value and consolation in the theory that reliability of the parts is some evidence of the reliability of the whole.

Kerr's (163) use of the retest technique with low results has likewise received adverse criticism for failure to differentiate between those low correlation coefficients caused by actual personality changes in the period between the tests and those related to the unreliability of the method.

It is because of the many difficulties inherent in the method that Piotrowski (232) maintains that reliability and validity are inseparable and that validity, if established, carries with it reliability. While this is true, it must be emphasized that, until a high degree of validity has been established for all age groups and contrasted cultures as well as for abnormal cases, reliability should not be assumed.

Again, validity may be greater than reliability. A high degree of validity may be demonstrated by comparing successive Rorschach interpretations of an individual's record with outside clinical data, as Piotrowski suggests. Yet the reliability of these interpretations when compared with each other may not be high because different aspects of the personality may be emphasized on each occasion. Similarly, the interpretations of the same record by different examiners may exhibit a high degree of validity, yet lower reliability. For example, in the experiment comparing three blind diagnoses of the same Rorschach responses (133), despite the fact that there was considerable agreement among the three interpreters, the depressive features of the personality were emphasized by one, ascendant, excitable, and extroverted characteristics by another, and the conflict in reference to the female role by a third. Checks with clinical data showed all observations to be valid. Thus, Watson (304) fails to appreciate the reliability of the results, misinterpreting the different emphases as discrepancies, overlooking that inner turmoil, depressed feelings, and inferiority may lead to compensatory emphasis on superiority, ambition, dominance, and extroverted interests. Several interpretations of the same record may be valid then, but such validity cannot always imply a similar degree of reliability.

VALIDITY

In the process of standardization, by far the most important phase has been the determination of the validity of the Rorschach concepts. Throughout the 20 years, workers in the field have devoted themselves to this problem, some few subjecting it to actual experimental technique, others adhering to the traditional correlational procedures. More have resorted to group comparisons employing random groups and paired groups, normal and abnormal cases, and still others have contented themselves with individual case studies. Each has demonstrated to some degree the validity of some phase of the method.

Direct experimentation has contributed little so far, though some small beginnings are in sight. Few experiments have been designed specially to test the validity of the method, although such procedure provides the only effective means of determining why certain Rorschach patterns have definite psychological values. Despite Rorschach's own recommendations that experiments in space-rhythm, form genesis, the M factor as representative of inner

living, and color as index of emotionality be set up, none have as yet been attempted. Experimental procedures such as the use of the Lowenfeld Mosaic Test (Vernon, 299), the sugar tolerance curve based on adrenalin output as an indicator of emotional intensity (Diethelm, 64), the "Dembo situation," the "Luria Method," the pneumograph, and various Gestalt perceptual tests (Varvel, 294) have been suggested and tried out in conjunction with Rorschach results, but no systematic studies have appeared. An interesting finding is reported by Vernon (299), who reports a parallel between introversion as measured by the speed of fluctuation of reversible perspective figures (in line with McDougall's concept) and Rorschach's introversion.

Of interest also are the investigations producing artificial changes in normal and abnormal personality by hypnosis (Hakebush, *et al.*, 102; Sarbin, 261; Madow, 194), or by drugs (Kelley, Margulies, and Barrera, 160; Guttman, 100; Varvel, 294; Layman, 186; Robb, Kovitz, and Rapaport, 248; Kelley, Levine, *et al.*, 157, 158), demonstrating alterations in personality in terms of Rorschach patterns.

Again, Copelman and his co-workers (57, 198, 199) have adopted a physiological and neurological approach and sought to validate the Rorschach in the light of the dynamic activity of the brain. Inhibition, excitation, irradiation, and induction which take place upon the surface of the brain show a high correlation, they report, with temperament and constitution.

Some experiments using other materials have also included the Rorschach blots. They serve indirectly to substantiate some Rorschach findings. Thus, Oeser (216) was able to show characteristic differences with tachistoscopic experiments with form-dominant and color-dominant types. Birzele (33) employed pictures as an aid in determining character, with results in agreement with the Rorschach. A study of the Ach-Saharov Test exhibited results which corresponded to those obtained by the Rorschach, according to Hanfmann (104).

Other experimental studies not concerned directly with the Rorschach Method itself have dealt with similar material or similar problems and have contributed indirectly to the validation of some phase of the method. Included are such studies as the relative potency of color and form perception at various ages (Brian and Goodenough, 322), the relation of form and color reactors to intelligence (Engel, 326), color and picture choices of young

children (Hildreth, 328), the Japanese studies on the expressive emotional effects of colors (Tatibana, 342; Imada, 330), the development of the selective regard of color and form (Tobie, 344), the relation of color preferences to age (Rabello, 337), to social adjustment, mental capacities, temperament, and initiative (Thomasczewski, 343).

Many studies with clinical groups also have verified certain Rorschach results. Of interest here, for example, are the experiments of the perceptions of various demented groups (Ionasiu, Lungu, Iosit, and Cupcea, 142; Ionescu-Sisesti and Copelman, 143; Ionescu-Sisesti, Copelman, and Tumin, 144), and the study of the impairment of "abstract behavior" in schizophrenic patients (Bolles and Goldstein, 321), which furnish results which corroborate Rorschach findings in similar conditions. Mention should likewise be made of experiments with shadow pictures (Rombouts, 250; Wollrab, 308), cloud pictures (Stern, 283, 284), color splotches (Paulsen, 221), and the tautophone employed in the auditory apperceptive test (Shakow and Rosenzweig, 272), which exhibit results comparable to those obtained by the Rorschach.

Orthodox procedure would procure an outside criterion and correlate isolated Rorschach categories or patterns. But this has met with only partial success. Fairly satisfactory correspondence has been reported for some of the so-called intellectual factors and other indices of intelligence (Beck, 12; Hertz, 114; Vernon, 298, 299, 300), and some suggestive correlations have been obtained between scores in paper-and-pencil tests and isolated emotional Rorschach categories (Hertz, 114; Vernon, 298; Vaughn and Krug, 297). Many studies, however, fail to obtain significant correlations (Thornton and Guilford, 290; Kerr, 163).

But, as frequently asserted, low results do not reflect the invalidity of the Rorschach Method. Correlational technique involves abstraction of the Rorschach factors as separate, distinct, and statistical variables, while the Rorschach patterns are conceived as component parts of a larger whole and therefore demand a technique which conserves the integrated whole of the inter-related patterns. The correlational method is obviously inadequate for the Rorschach Method.

Of greater bulk, by far, in the studies of validation is the research based on the comparisons of contrasted groups. Many of the personality pictures for normal adults of varying intelligence

and for mentally disordered cases advanced by Rorschach (as summarized by Bohm (40) in the third edition of the *Psychodiagnostik*) have been confirmed. During the 20 years since Rorschach, age groups of all kinds have been differentiated and various types of personalities analyzed and compared. The groups studied include:

- Superior individuals (Beck, 21; Maza, 200).
- Individuals of low intelligence (Pfister, 224; Beck, 21; Dubitscher, 69, 70; Maza, 200; Kubo, 185; Schneider, 269; Ganz and Loosli-Usteri, 86).
- Adolescents of high average intelligence (Hertz, 115).
- Average children (Salas, 258).
- Preschool children (Klopfer and Margulies, 177).
- School beginners (Paulsen, 220).
- Stable and unstable individuals (Hertz, 114; Line and Griffin, 188, 189).
- Ascendant and submissive individuals (Hertz, 114; Vernon, 299).
- Most adjusted and least adjusted girls (Hertz and Wolfson, 112).
- College students (Powell, 243; Varvel, 295, 296).
- Depressed normal adults (Guirdham, 96).
- Coarted normal adults (Guirdham, 96; Varvel, 295).
- Stutterers and nonstutterers (Meltzer, 202, 203; Ingebregtsen, 141).
- Problem children (Beck, 11, 21).
- Clinic children (Loosli-Usteri, 191; Kerr, 162).
- Delinquents (Endara, 74-76; Kogan, 181; Gozzano, 89; Pescor, 222, 223).

Almost every kind of mental disorder has been subjected to scrutiny and a diversity of problems in each investigated. Characteristic pictures for particular groups have emerged in sharp relief. In this area, the list of studies is impressive:

- Schizophrenia (Kretschmer, 183; Guirdham, 96; Bleuler, 37; Schneider, 269; Skalweit, 279; Hackfield, 102; Vaughn and Krug, 297; Dimmick, 65; Rickers-Orsiankina, 246; Beck, 22; Hirning, 134; Hylkema, 140; Costa, 58; Layman, 186).
- Defective and schizophrenic children (Piotrowski, 231).
- Manic-depressive psychosis (Levy and Beck, 187; Beck, 21; Varvel, 295).
- Manics (Beck, 21; Juarros, 149).
- Neuroses (Guirdham, 94; Zulliger, 309, 315, 316; Binder, 30, 31; Beck, 21; Piotrowski, 234; Hackfield, 101; Ross, 254, 255).
- Obsessional neuroses (Bustamente, 54; Piotrowski, 234).
- Depressive states in various mental disorders (Guirdham, 96; Varvel, 295; Beck, 21).
- Melancholics (Guirdham, 97; Juarros, 149).
- Organic psychoses (Oberholzer, 213-215; Piotrowski, 225, 226, 227, 229, 233, 240, 241; Harrower-Erickson, 106, 107; Mahler-Schönburger

and Silberpfennig, 195, 196; Hunt, 136; Schenk, 267; Nadel, 211, 212; Sanders, Schenk, and Van Veen, 259).

Psychopaths (Dubitscher, 69, 70; Binder, 30, 31).

Epilepsy (Eyrich, 77; Guirdham, 95; Stauder, 282; Arluck, 7; Borges, 45; Drohocki, 66, 67).

Parkinsonism (Aubrun, 8; Ionescu-Sisesti and Copelman, 143).

Delirium tremens and alcohol hallucinations (Weber, 305).

Alcoholics (Jastak, 148).

Arthritis (Booth and Klopfer, 44; Booth, 42, 43).

Of especial value are the monographs of Beck (22) and Rickers-Ovsiankina (246), which contain detailed analyses of the psychological structure of the schizophrenic in terms of significant patterns; the studies of Guirdham (96, 97) on depressed structure in the various clinical disorders, with his recommendation for the establishment of differentiating mathematical formulae such as the index of stereotypy (S/E) as a means of objective validation of the Rorschach Method; and Varvel's (295) statistical study of psychotic and neurotic depressions. Of importance are the investigations of the neurotic personality by Levy and Beck (187), Guirdham (94), Binder (30, 31), Piotrowski (234), and Brosin and Fromm (50); the systematized and explicit analysis of the Rorschach patterns in organic and neurological disturbances by Piotrowski (225, 226, 227, 229, 233, 240, 241) and Harrower-Erickson (106, 107); and the monograph on the changes characteristic of congenital epilepsy and epilepsy of an exogenous nature by Stauder (282). And of outstanding interest also is the development of the method as a prognostic instrument in the insulin treatment of schizophrenia by Piotrowski (236, 237, 239). The extensive research in these fields, summarized by Kelley and Klopfer (156) for schizophrenia, Miale and Harrower-Erickson (206) for the neuroses, Piotrowski (233) for the organic disturbances, and Kelley and Barrera (155) for the field in general, has contributed substantially to the validity of the Rorschach Method.

In this connection it should be mentioned also that the approach by group comparison has included evaluation of the Rorschach *Erlebnistypen* with combinations formulated upon other typological systems. But in such studies, systematic and statistical comparisons are not made, and results, even where reported, are not reliable. In addition, the types are not comparable, in that the same total systems, personality levels, or meanings are not present. It has been amply demonstrated, for example, that the *Erlebnistypen* have little in common with Jung's typology (Bailey,

9; Vernon, 299; Guilford, 93; Piotrowski, 232) or with the eidetic types (Bryn, 52). A more recent study by Waals (303) views the relationship between Jung's association method and the Rorschach types as complementary, the former eliciting the "complexes," the latter, the reaction-type, both, however, shedding light on the affectivity.

A vast amount of literature deals with the correspondence between Kretschmer's constitutional types and the Rorschach. Dubitscher (69) corroborates earlier findings of the relationship between the two systems. Skalweit (280) fails to find Rorschach similarities between "schizoid" and schizophrenics, as Kretschmer indicates. Other more recent studies differentiate between cyclothymes and schizothymes in terms of Rorschach patterns (Jacobsen, 145; Jarrin, 147) and between four different blood groups (Göbber, 88). While Langner's study (332) with contemporary writers does not employ the Rorschach material directly, it seems to verify previous findings that cyclothymic individuals are predominantly color-minded.

Few of these studies, however, present reliably positive results, especially since the Kretschmer types themselves have not been demonstrated as reliable. They contribute little, therefore, to the scientific validation of the Rorschach Method.

Studies based on the comparative method demonstrate for the most part that the Rorschach Method can differentiate the groups reliably. To that extent, its validity as a diagnostic instrument has been established. Furthermore, to a degree, certain Rorschach patterns appear more reliably in one group than in another. To that degree, those patterns may be said to be associated with the dominant personality patterns of that group and, inferentially, to be reflective of them.

Clinical validation has likewise been presented in terms of case studies. The literature abounds with comparisons of Rorschach interpretations with outside criteria—case records, data from intelligence tests, personality measures, vocational interests, teachers' reports, psychoanalytic records, and other information. The "blind diagnosis" as originally suggested by Rorschach is frequently employed and becomes an invaluable means for demonstrating the validity of the method. Where independent interpretations made without knowledge of the subject other than his age and sex compare favorably with outside clinical and test data, one of the goals of scientific procedure is approached.

The success of blind diagnosis of normal individuals and especially in specific clinical cases is impressive (Kerr, 162; Troup and Klopfer, 292; Sill, 278; Zulliger, 311, 317; Jacobson, 146; Kaplan, Miale, and Clapp, 152). The study of three blind diagnoses by three experienced interpreters in different parts of the country exhibits such high agreement that the method is accepted as having high diagnostic validity (Hertz and Rubenstein, 133).

Illustrative of the role of the individual case study in demonstrating the validity of the Rorschach method are the extensive reports on specific clinical cases as:

A case of compulsion neurosis (Piotrowski, 234).

Anxiety attacks in two children (Ombredane, Suarès, and Canivet, 217).

An epileptic case with psychoneurotic manifestations (Piotrowski and Kelley, 242).

A bilateral lobectomy case, presented in a series of reports on three successive examinations (Tallman and Klopfer, 288; Klopfer and Miale, 178; Klopfer and Tallman, 180).

A case of the analysis of differential diagnosis of the brain (Oberholzer, 213, 214).

A Pick's disease case (Piotrowski, 227).

Personality changes accompanying organic brain lesions in two pre-adolescent children (Harrower-Erickson and Miale, 109).

Cases before and after operation for brain tumor (Nadel, 211, 212).

Cases of chronic arthritis (Booth and Klopfer, 44).

A case of dementia paralytica before and after malaria treatment (Oppenheimer and Speyer, 218).

Two habitual homicidal criminals (Endara, 74).

Cases in schizophrenia (Hirning, 134; Hylkema, 140; Just, 151).

A defective delinquent (Day, Hartoch, and Schachtel, 63).

Case studies in convulsive states (Kelley and Margulies, 159).

Even more impressive, however, are the results from blind diagnoses of groups of cases. Hunter (139), for example, compares the interpretations of 50 pupils with various intelligence and personality estimates with a high degree of success. Especially the study of Benjamin and Ebaugh (27) of 50 patients, which compares the Rorschach diagnoses with both preliminary clinical and final clinical diagnoses, and which shows remarkable agreement—85% complete agreement and 98% agreement in major diagnoses—testifies eloquently to its diagnostic value. Even in the few instances reported, where the method was not sufficiently reliable to make accurate diagnoses, it is admitted that qualitative analysis of the records contributed to the understanding of the disorder (Cardona, 55).

Mention also should be made here of the psychoanalytic validation of Rorschach interpretations. Many of the concepts, like the form, movement, and shading categories, have been substantiated in part by psychoanalytic data (Furrer, 84, 85; Bustamente, 54; Shuey, 275; Binder, 30; Schachtel, 263). Rorschach himself employed the independent psychoanalysis of one of his cases by Oberholzer (252) to validate various aspects of his interpretation. Many examiners have followed Rorschach in this procedure, checking their interpretations with dynamic characterizations based on psychoanalysis (Varvel, 294; Binder, 30, 31; Hertz and Rubenstein, 133).

Graphology likewise has served to validate the Rorschach Method, many of the studies showing a high degree of correspondence between graphological analyses and Rorschach interpretations (Vernon, 298; Diethelm, 64; Biäsch, 28; Hartoch and Schachtel, 110; Benjamin and Ebaugh, 27; Stein-Lewison, 44; Drope, 68). The possibilities in using both procedures have been described by Diethelm (64), Booth (43), and Schade (266).

Another form of blind diagnosis has been advanced by Vernon (302) in his *method of correct matching*, in which Rorschach interpretations are matched with sketches independently prepared from other data. The method is unique, since it permits expression of quantitative relationships based upon qualitative judgments of the personality as a whole. Vernon (300) was able to report a correlation of $.78 \pm .06$ between the clinician's ability to estimate the intelligence of 20 subjects and responses on the Rorschach. Again, Vernon (299) reports success among judges in matching the Rorschach interpretations of the personality of 45 subjects with personality sketches independently prepared, a degree of success represented by a contingency correlation coefficient of $.833 \pm .032$. Because of such validation, Vernon concludes that the application of the method from the clinical viewpoint is scientifically justifiable.

Troup (291) employed this method to determine the degree of similarity in the personality make-up of 20 pairs of identical twins. Satisfactory success is likewise reported by Patterson and Magaw (219), who demonstrate the validity of the method in its application to mentally defective problem children. Both Troup and Vernon, however, admit that the matching method has definite limitations in its application to material as complex as the Rorschach data, and Benjamin and Ebaugh (27) show that it is defi-

nately unsuited to Rorschach material, preferring the orthodox procedure of blind diagnosis.

Clinical validation obviously has yielded the most significant results. There can be little doubt that comparative clinical studies in the last decade, especially, have presented empirical proof at least of the value of the Rorschach Method as a clinical instrument of diagnosis and prognosis, and thus argue for its potentialities as an instrument of psychiatric research.

As a result of these validating studies, widespread acceptance and extensive application of the method in fields of psychology, psychiatry, psychoanalysis, pedagogy, anthropology, delinquency, and social service (Miale, 204; Barry and Sender, 10) have followed. Such application has in turn served as a "working" validation of the method.

In the field of child guidance, in the last decade especially, the method has been used to study intelligence, special abilities, personality development, school adjustment, personality problems (Paulsen, 220; Hoel, 135; Hunter, 139; Zulliger, 310, 312-314; Loosli-Usteri, 191). It has been applied to problems of heredity to demonstrate family similarities, twin similarity, and to determine the relative influence of heredity and environment on personality (Bleuler, 35, 36; Kerr, 163; Brander, 46; Troup, 291; Saudé, 262; Marinesco, Kreindler, and Copelman, 198). It has been applied to different culture groups (Bleuler, 39; Hallowell, 103; Hunter, 138), to the study of the constancy of personality traits (Loosli-Usteri, 191; Suarès, 285, 286), and to the study of the adolescent personality (Shapiro-Pollak, 273, 274; Hertz, 126, 129; Hertz and Baker, 130, 131). Its use in the fields of education, college guidance, and vocational guidance is ever increasing (Roemer 249; Schneider, 268, 269; Brendgen, 49; Zulliger, 310, 313, 314; Munroe, 209).

It has been put to service in mental hygiene and child guidance clinics to analyze personality difficulties, to study fears and anxieties, and to judge the effectiveness of psychotherapy; in counseling and advising services of colleges, in court work (Dunn, 10), in the study of delinquents (Kogan, 181; Zulliger, 317; Day, Hartoch, and Schachtel, 63), and in social service work (Krafft, 182).

Its greatest application has been, of course, in the psychiatric field (Aguiar, 1, 2; MacCalman, 193; Kelley and Barrera, 155) to give an insight into psychological difficulties; to aid in difficult differential diagnosis (Guirdham, 96; Piotrowski and Kelley, 242;

Booth, 43; Piotrowski, 240, 241); to study personality following cerebral lesions, under the influence of drugs or hypnosis (Layman, 186; Robb, Kovitz, Rapaport, 248; Brown and Orbison, 51); to determine choice of psychotherapeutic approach; to gauge the effectiveness of therapy; and for prediction (Piotrowski, 236, 237, 239; Graham, 91; Rymer, Benjamin, and Ebaugh, 256).

Its potentialities as an instrument to diagnose stable and unstable personalities in soldiers has recently been discussed by Harrower-Erickson (108) as an aid for the evaluation of aptitude for flight training by Bigelow (29).

In all this work, while interest has been primarily directed to specific problems of diagnosis, guidance, or prognosis, this application has served also to determine the validity and usefulness of the method itself.

EVALUATION

Results such as these reflect creative research and arduous labor—research characterized by the gradual standardization of the procedure, by efforts to supplement qualitative analysis with scoring criteria and norms, by more critical manipulation of data, by increasingly critical attitudes, by an insistence upon more controlled investigations, and by greater and more extensive application. But despite its impressiveness, much remains fragmentary. Many of the results have been challenged, and the validity of the method has yet to win complete scientific acceptance.

There is good reason, however, why the validity of the method has been subjected to challenge. It is because of the uniqueness of the Rorschach Method that our results have been inadequate in so many cases. The method is essentially qualitative, and the processes of standardization and validation demand procedures which are appropriate to qualitative concepts.

Many reject the traditional experimental studies because, they claim, the abortive dissection of the psychogram in the search for static factors in isolation has distorted the method. The statistical procedures have been censured because of their emphasis on quantitative measurements, hypothetical averages, uniformities, and generalities, at the expense of understanding the individual himself.

While it is true that some parts of the Rorschach Method defy measurement, statistical treatment is imperative in certain phases of the research. It must be kept in mind that statistics is merely a tool for describing, analyzing, and summarizing data. One cannot

object to its use where data must be treated in this way. There is no right or wrong to the use of statistics with the Rorschach Method. It should not be at the service of the experimentalist exclusively because he is more interested in mass data, uniformities, and generalities. Nor should it be avoided by the clinician because he is primarily interested in individual diagnosis. As a matter of fact, it has been demonstrated that the structure of a single personality may be made subject to statistical analysis (Allport, 318; Lewin, 334; Baldwin, 320).

Statistical treatment should be employed where necessary, and other techniques applied where they are better suited to the problem. Application of the statistical method to Rorschach data, however, does not *per se* render the whole method quantitative, mechanical, or sterile. On the contrary, it insures accuracy and reliability of quantitative results.

Thus, statistical methods have a definite place in research with Rorschach data. Orthodox procedures which have been extensively used with success in psychological problems should not be avoided where they are applicable. Measures of central tendency, of dispersion, of reliability, and of validity should be obtained where possible. Other statistical devices, perhaps more applicable to the data, might be used. Criteria for scoring the Rorschach categories, determination of norms, age and sex differences must be based upon some statistical foundations. Comparative studies, many of which have been presented by clinicians, are quantitative studies, and results reported without recourse to statistics are of doubtful value (25, 172). Statistics must be employed to establish the reliability of these findings if they are to be accepted as factual data.

But the value of statistical treatment is no justification for overemphasis. There can be no doubt that conclusions concerning the internal organization of the traits of an individual, concerning his "private worlds" in Frank's terminology (82), cannot be based on means, medians, sigmas, or percentiles. Statistics can never supplant the insight of the clinician.

Hence, the method of clinical validation has tended to monopolize attention in determining the validity of the Rorschach Method. But many object to exclusive reliance on this type of validation in its present stage of development.

The chief objection to clinical validation is its lack of scientific procedure. Most clinical studies are characterized by few cases, inadequate controls, failure to describe the techniques employed,

and failure to standardize the research procedure. Case studies all too frequently include highly subjective diagnoses and dogmatic assertions.

Too often the experience of the clinician determines the scoring, the interpretation of the record, and the validity of that interpretation. The fact that one is expert and holds certain interpretations valid by virtue of experience is no proof of their validity. We may admire the expert, we may be trained and guided by him, but we must not forget that his intuitive deductions are not scientific formulations. In my opinion, no matter how expert a "Rorschacher" is, he will be eager to rationalize his intuitions through the scientific method.

Case studies have their place. They are essential for preliminary exploration. Their findings are inconclusive, however, and await further research. I do not mean to imply that findings from clinical studies should not be reported because they do not meet scientific requirements, but I do insist that we should recognize their results for what they are—that is, promising hypotheses which call for further study under carefully controlled conditions.

Clinical validation should not be outside the bounds of scientific procedure. Only that which is valid in the Rorschach Method should be accepted, and that which is valid depends upon critical and proven analysis.

Thus, for example, the application of the Rorschach should not be limited to the abnormal, and while the abnormal may help to explain the normal, the latter is not without its own power to shed light.

Again, indiscriminate application of the Rorschach patterns in their present state of validation is hazardous. They are neither equally adequate nor equally valid at all age levels or in different culture groups. The method, for example, is now applied to children at the lower age levels. Yet the validity of the patterns in terms of these younger age groups has never been established. Thus, meanings validated only on the basis of clinical data and reactions of adults are used to interpret the reactions of the child. Adult reactions may not be valid criteria for children's reactions. Certainly we have no right to assume that patterns validated on psychiatric material apply likewise to children. On the contrary, we recognize many patterns in young children which have been identified with pathology in adults.

Validation of Rorschach concepts must be established system-

atically and scientifically at all age levels and for contrasted cultures. But it should be emphasized that this does not mean exclusive reliance on traditional statistical procedure.

Those of us who are experimentalists must shake off the shackles of traditional procedure and explore new fields. Those of us who are clinicians must forsake, however unwillingly, the allurements of blind diagnoses and explore the less spectacular realm of scientific research.

Our problem is twofold: to develop a method for further standardization and validation, more in tune with our qualitative instrument, and to determine criteria of evaluation of its validity.

It is consoling to realize that our problem is not unique, that it is the problem of all qualitative methods for the study of the individual (319). We must go into other fields of personality and utilize and synthesize the research there. We must pioneer with all students of personality in elaborating old techniques to make them more applicable to qualitative procedure. We must forge new techniques which will place the method on firm scientific foundations without sacrificing values of qualitative analysis.

We must explore methods which have already yielded promising results. Vernon's matching method, for example, may be further developed, since it permits quantitative relationships to be based on qualitative judgments of the personality viewed as an integral whole. The blind diagnosis technique may be expanded to *multiple blind diagnoses* where many interpreters work independently on the same Rorschach material and clinical data, along the lines already suggested by Rosenzweig (253) and Hertz and Rubenstein (133). If agreement can be obtained among several interpreters statistically based on a number of cases, the reliability and validity of the method will meet scientific requirements.

Case studies also may be developed in the manner advocated by Allport (318) to earn a place in the scientific validation of the Rorschach Method. If each case were to include scientific controls, systematic recording of data, measures of reliability, and the like, it might serve to validate Rorschach results.

Experimental projects should be set up including experimental and clinical techniques such as the program described by Murray (210) at the Harvard Psychological Clinic. Various methods were employed: tests, interviews, projective techniques including the Rorschach Method, and direct experimentation. In such projects, one technique serves as a check upon the other.

In determining outside criteria, direct sampling of the personality or behavior with procedures which precipitate the behavior process is most promising. Better use should be made of partially controlled situations for eliciting personal data, in line with Olson's method of time sampling (336) or with methods described by Lewin (334). Much progress has already been made by "topologists" in testing out their concepts of resumption of interrupted activities, degrees of reality, level of aspiration, reward and punishment, and the like, and they have contributed promising methods and results for the quantitative analysis of some problems of human motivation (Brown and Lewin, 324; Brown, 323).

Other projective techniques, such as those described by Frank (81, 82), may be developed (Kerr, 331; Rotter, 338). If and when such projective techniques meet with scientific acceptance, they should invite our serious attention, for they may shed light upon the path we follow.

Today, crucial psychoanalytic concepts such as fantasies, wishful thinking, projections, and repressions are being studied under controlled laboratory conditions (Murray, *et al.*, 335). Those psychoanalytic concepts which earn scientific acceptance may be enlisted in our service.

But, most of all, new procedures must be invoked which will emphasize the uniqueness of the individual and make even group uniformities meaningful. It would seem that the first step should be a systematic determination of those Rorschach patterns which are psychologically significant.

Experiments set up on the genesis of form, movement, or color in various age groups would establish tendencies for each age level, somewhat in the order of Dworetzki's study (73) of the evolution of perception in children 3 to 15 years of age on the basis of Rorschach ink-blot and ambiguous designs. Norms established in this way, based on functional concepts, would be psychologically meaningful. Extending this procedure to the abnormal, to the feebleminded, for example, would serve to establish not only quantitative, but qualitative, differences in the characteristic patterns attained.

Best of all, concentration on *one individual* in the tradition of the clinician, as Allport recommends (318), would be scientifically productive. Experimentation with one individual would determine basic traits in that individual which are characteristically revealed by him under a diversity of circumstances, or in specific situations, or in partially controlled situations, whatever method

were adopted. A child, for example, could be placed in many and varied situations which call for ascendant behavior, or imaginative activity, or emotional excitability, and his reactions systematically observed and recorded. Characteristic personality traits can be established for him, and generalization can be made as to his dominant personality traits, their range, and even their intensity. Using these results as criteria, Rorschach patterns might be identified as psychologically meaningful in terms of the individual. A representative sampling of these patterns might be developed for the individual, and a configuration of patterns built up for him.

Such meaningful Rorschach patterns developed in one individual might likewise be developed in many individuals. If we could prosecute such individual study systematically in many individuals, patterns might be compared, generalizations extended to the group, and meaningful norms constructed.

Longitudinal studies following children through periods of time would be fertile ground for further standardization and validation of the method. They would give us a picture of the developing individual in terms of Rorschach patterns, and the sequences of patterns which characteristically emerge in serial order might be established. Here we would have group norms in dynamic terms. Even psychological principles might be established as to the emergence, the growth, the maturing of personality patterns, and other significant developmental changes in personality.

This procedure would serve to standardize the Rorschach Method as uniquely it demands standardization, emphasizing the "unique idiomatic character of the personality," yet retaining interest in generalizations and uniformities. And this procedure could be prosecuted with a quantitative precision and a scientific objectivity which would satisfy the traditional experimentalist.

All these suggestions and more offer challenging opportunities for future research.

In conclusion, it can be said that much has been accomplished in the last 20 years. It has been a productive, creative, and pioneering period in our history, but much more remains to be done. Research in the true sense of the term has just begun.

Our immediate obligation is to continue the process of standardization in form and character that will best serve our method. It is our function to organize coördinated research projects, to make a concerted drive on the same problems at the same time, to

infuse with meaning the empirical facts which we have amassed, and thus to add scientific results to our store of knowledge.

To occupy ourselves with ink-blots, even though we pursue the minutiae of scientific investigation at a time when civilization is subjected to the *Blitz-krieg*, appears ironical. But it is an irony that loses its bitterness if we can come to believe that by our labors we are forging the instrumentalities whereby the world may yet achieve sanity.

Today, if ever, we must bring all our energy, insight, research, and leadership to bear upon our joint task—to maintain mental health and efficiency in the midst of chaos and despair, to restore and revive mental balance in an imbalanced world, to help fashion, if not for ourselves, for our children at least, a society more worthy of human life and human dignity.

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PROCEEDINGS OF THE THIRTY-SEVENTH ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY

NORMAN L. MUNN, SECRETARY, VANDERBILT UNIVERSITY

The Thirty-seventh Annual Meeting convened in Nashville, Tennessee, April 2 to 4, 1942 with Vanderbilt University and Peabody College as host institutions. All meetings were held in the Maxwell House Hotel. A local committee under the chairmanship of Paul Boynton and consisting of Eugene Bugg, Meredith P. Crawford, Joe E. Moore, and Franklin C. Paschal, made local arrangements for the meeting.

The Council of the Society met in executive session on Thursday at 8:00 P.M., with Fritz Marti presiding. Other council members present were Wayne Dennis, B. von Haller Gilmer, C. P. Heinlein, Harold N. Lee, John Paul Nafe, Herbert C. Sanborn, William P. Warren, and the Secretary.

There were two philosophy and three psychology sessions on Friday. A joint session on philosophy and psychology was held Saturday morning. Twelve philosophy and twenty-one psychology papers were presented during these sessions. Chairmen for the philosophy sections were Axell Brett and Eugene Bugg. The psychology sessions were presided over by Joseph E. Moore, Emily S. Dexter, and John Paul Nafe. Fritz Marti presided at the joint session.

At 4:30 P.M. on Friday, the members of the society and their friends were complimented at a tea given by Vanderbilt University and Peabody College in the Social Religious Building at Peabody College.

The annual banquet was held Friday at 7:00 P.M. in the Maxwell House Ballroom with an attendance of eighty. After the banquet an address of welcome was delivered by President S. C. Garrison of Peabody College. This was followed by President Fritz Marti's paper on "The College, Religion, and Philosophy."

The annual business meeting convened at 12:30 P.M. on Saturday with President Fritz Marti in the chair.

MINUTES OF THE ANNUAL BUSINESS MEETING

The minutes of the Thirty-sixth Annual Business Meeting of the Society were approved as published in the *Psychological Bulletin*, 1941, Vol. 38, No. 8, pp. 683-703.

The report of the Secretary, which related duties performed during the year, was approved as read. It was reported that one member, Harry M. Capps, died during the year. Two members resigned and five were dropped for nonpayment of dues. Members at the time of the meeting numbered 279, twelve more than at the Washington meeting.

Dr. Albert G. A. Balz, chairman of the Standing Committee on Philosophy, reported concerning the present status of his compilation of the biographies and bibliographies of philosophers who have taught or who are at present teaching in the southern region. Appreciation of Dr. Balz's work was expressed.

On the Council's recommendation, fourteen new members were admitted to the Society. These are: James Anderson, Xavier University; Joseph B. Bassich, Loyola University; Charles W. Burts, Furman University; Frank W. Finger, University of Virginia; Susan W. Gray, Florida State College for Women; Lillian M. Johnson, Western Kentucky Teachers College; Jean M. MacDonald, Florida State College for Women; Frederick E. Nolting, Jr., University of Virginia; Laurence J. O'Rourke, U. S. Civil Service Commission; Joseph J. Ray, Peabody College; Kenyon R. Runner, Armored Force Replacement Training Center, Fort Knox; Harry G. Schrickel, Carnegie Institute of Technology; Mack B. Stokes, Emory University; Frank C. Wegener, University of Virginia.

On recommendation of the Council the following officers were elected: President, Christian Paul Heinlein of Florida State College for Women; Secretary-Treasurer, Wayne Dennis of the Louisiana State University; Council, Elizabeth Duffy of the Woman's College of the University of North Carolina; Peter A. Carmichael of the Louisiana State University, and S. Rains Wallace, Jr., of Tulane University.

A recommendation of the Council to hold the next meeting in Chattanooga was approved subject to further investigation concerning accommodations and transportation facilities. The Council was authorized to move the location of the meeting if conditions appeared to warrant such a change. The meeting was then adjourned.

PROGRAM

Friday Morning Session, April 3.

PSYCHOLOGY

Section I

JOSEPH E. MOORE, Chairman

Group Rational Learning Test Through Direct Positive Panchromatic Films. HENRY F. DICKENSON, Lincoln Memorial University.

This test of Group Rational Learning demonstrates the practicability of the screen version over the original (oral) group rational learning tests. It was administered to over two thousand subjects of high school and

college ages. Uniform presentation and timing of items through pictures perceptibly increased the reliability and validity of the test.

The actual test requires two hours, with a slight rest period in the middle. Provision is inherent in the test for greater objectivity than is usually afforded by the group test. Two equivalent halves serve the same purpose, as two forms if shorter tests are desired. High scores on the test are closely associated with attention, recall, inductive-deductive reasoning, scholastic ability, persistence, mental multiplication, performance ability, and such requisites of general success.

The Relationship Between Self-Estimated and Measured Interests. D. J. MOFFIE, North Carolina State College.

The vocational guidance counselor is often required, by sheer necessity, to ask his patient the direct question, "Are you interested in law, medicine, engineering, teaching, or some other specific occupation?" It was the purpose of this investigation to determine the value of the above statement. A questionnaire, on which were given the main groups and occupations as reported by the Strong Interest Blank, was administered to eighty N.Y.A. students. Each student was asked to rate his interests for the groups and specific occupations. Pearson coefficients were obtained between estimated ratings and the scores on the Strong Interest Blank. Coefficients ranged from $-.07$ to $+.47$ for groups I, II, V, VIII, IX, and X. Correlations on twenty other specific occupations, selected at random, are also to be reported.

Tentative results appear to indicate that very little value can be placed on the self-estimated interests of an individual. Predictions, therefore, based entirely on the estimated interests in these occupations cannot be used to determine interests as measured by the Strong Interest Blank.

The Prediction of Differential Achievement in a Technological College. WILLIAM MCGEEHEE, North Carolina State College.

This study attempts to determine the value of the American Council Psychological Examination, the Cooperative English Test (Form OM), and the Cooperative Mathematics Test (Form P) in predicting academic achievement in a technological college and in the various major curricula of the college. Scores on the three specified tests made by 700 freshmen admitted at the beginning of the 1939-40 school year are studied in relationship to grades made by these enrollees during the academic year of 1939-40. Zero order correlation coefficients of each of the tests with the grades are of about the same magnitude when the scores and grades of the group are studied, regardless of curricula enrollment. However, the tests vary in their prognostic value for the various curricula; in general, all three tests have the least predictive value in regard to the achievement of students enrolled in agriculture and textile curricula. Multiple correlational analysis does not indicate significant difference in the predictive value of the three tests. Negative results are secured when the academic achievement of the students ranking at different levels on the tests are studied against the students' grades. Implications of the data in regard to testing programs in technological schools are presented.

The Place of Repetitive Practice in One Kind of Meaningful Learning.
WILLIAM A. BROWNELL, Duke University.

The subjects of this investigation were 63 third-grade children. In grades 1 and 2 they had been taught the 100 simple addition facts and the corresponding 100 subtraction facts. The method of instruction was that of drill,—number stimuli, such as $6 + 4$, were regularly presented orally or in writing in a way which encouraged immediate responses of the answers alone, without reflective thought or any form of solution.

Two series of tests were given at intervals of a month: (1) written group tests on the 100 addition facts (Tests I, II, and III) and (2) individual oral tests (Interviews A, B, and C). Test I and Interview A were administered one month after the start of the fall term. During the next month five minutes a day were taken from the arithmetic period for further drill on the addition facts. Test II and Interview B followed. During the next four weeks there was no special drill on the addition facts beyond their use in the computations of daily lessons. Then came Test III and Interview C.

The results of the group tests agreed with the results of several other similar investigations: efficiency, as measured by rate and accuracy of response, improved considerably between Test I and Test II, and slightly between Test II and Test III. The interview data were unique: such data have not before been reported in investigations of the effects of drill. These data revealed (1) the reason for the improvement in efficiency and (2) the limitations of repetitive practice. The implications of the findings for educational practice and for psychological theory and research relating to meaningful learning are discussed.

On the Weighting of Broad Categories. F. C. PASCHAL, Vanderbilt University.

When data are cast into the form of a few broad categories, as in a rating scale, quantification is frequently desired for statistical purposes. Such quantification must be soundly based if the resulting statistics are to be meaningful. One type is that in which an underlying continuous variate may be assumed, whose distribution conforms to the normal distribution curve. Kelley has offered a technique whereby each category is weighted in terms of the mean deviation of a truncated segment of the surface of the curve. A simplified procedure is proposed, utilizing the median deviation in its stead, the mid-percentile of each category being converted into standard deviation units. These weights may be turned into the Kelley weights, if so desired, by the addition of certain empirically determined constants which, by way of illustration, are .11, .03, .01, .03, and .11 sigma for five categories or .11, .01, and .11 for three categories. The resulting deviation from the Kelley figures is at no time greater than .02 sigma.

This argument is particularly applicable to the treatment of college marks where the grade distribution is known. The assumption that the distribution of college marks meets the conditions stated above seems a better assumption than the usual one, which is that grades constitute the

grouping by intervals of measures having equal baseline units. No standard deviation can be derived since it has an assigned value of unity.

General Rules for Predicting the Selectivity of a Test When the Standardizing Population and the Parent Population are not Necessarily Homogeneous. H. M. JOHNSON, Tulane University.

The rules to be discussed are general but are here illustrated in the procedure which employs critical scores or non-quantitative criteria in test and trait. Such procedures give rise to 2×2 contingency tables, yielding Pearsonian $r = \Delta / N \sqrt{p_1 q_1 p_2 q_2}$, in which p_1, p_2 is the probability of attaining the criterion set for test and trait respectively, and $\Delta = (AB) - N p_1 q_1$. The selective power of the test is measured by $\Gamma / N = 2\Delta / N$ —i.e., by the relative number of individuals improperly classified by chance but properly reclassified by the test. Thus if p_1, p_2 are given, Γ / N is proportional to r . However, for perfect correlation, the maximum selectivity $\Gamma / N = 0.5$, which requires $p_1 = q_1 = p_2$. If r is given, and if also—as it often happens— p_2 is fixed by external limitations, then the selectivity of the test is proportional to $\sqrt{p_1 q_1}$, and declines rapidly as their factor deviates from 0.5. Although these relationships are obvious from analysis of the definition of r given above, they are often overlooked, so that a test may seem to be quite effective when in fact most or nearly all the individuals are properly classified by chance. The facts also tell us what changes in selectivity to expect if a test which has been standardized on a sample population is transferred to a parent population which is not homogeneous with the standardizing sample.

Section II

EMILY S. DEXTER, Chairman

Factors Affecting Skin Color Judgments of Negro College Students. ELI S. MARKS, Fisk University.

Two groups of students at Fisk University were asked to rate each other for skin color and attractiveness. Each judge also indicated how well he or she knew each person rated. For most judges, the ratings of skin color showed a correlation with those for attractiveness. In general, subjects rated as light in color were also rated as attractive, while subjects rated as dark in color were considered unattractive. The skin color of the judge (in terms of the average rating of all raters) also appears to be correlated with his or her rating of other persons. The darker judges assign lighter values when rating an individual than do the lighter judges. The amount of "displacement" in rating attributable to the judge's skin color varies with the color of the subject rated, the greatest "displacement" appearing for subjects in the middle skin color range. The evidence would indicate that: (1) the reference scale used in rating skin color is in part a function of the relative colors of the judge and the subject rated; (2) there is a preference for persons of lighter colors but not for extremely light individuals; (3) there is a tendency to displace the rating of liked individuals in the direction of the preferred skin color.

Some Personality Adjustments of Negro College Students as Indicated by Tests and Ratings. LILY BRUNSCHWIG, Fisk University.

Personality tests, including the Bell Adjustment Inventory, the two forms of the Minnesota Inventory of Social Attitudes, and the Pessimism: Optimism Scale of Chant and Myers were administered to 87 Fisk University students. Each of the students tested was asked to rate himself and as many of the other subjects as he knew on a rating scale containing measures of 11 behavior tendencies. Scores in the areas of Happiness, Sociability, and Dominance respectively were obtained from the rating scales.

Intercorrelations among the tests and among the tests and ratings suggest the applicability of some of these paper and pencil measuring instruments as one approach to the study of personality adjustments in a population differing somewhat socially and geographically from the populations employed for the development of the tests. Additional insight into the validity of the measures employed is furnished by personal interviews and observation of subjects, as well as by the nature of the rating supplied by each subject.

Behavioral Patterns of Young Children in an Insecure Situation. JEAN M. MACDONALD, Florida State College for Women.

The paper reports patterns of insecure behavior observed in the reactions of young children to a strange environment. Sixteen children, ranging in age from 11.2 to 21.4 months, were left alone in a strange room for 5 minute intervals on alternate days (A-group). Eight children, representing a comparable age-range, were left in the room with their mothers or "substitute mothers," i.e., attendants in the institutional nursery where the children lived (M-group). The total number of observational periods ranged from 5 to 11 in each group.

In addition to a latency-reaction, 6 primary patterns of behavior were observed, viz., patterns of non-motile withdrawal, agitated movement, retreat, attack, encapsulation and approach. Assuming that security is denoted by a particular relationship of the children to the situation, namely, by ability to respond to it in a positively adaptive rather than a negatively adaptive or emotional manner, 5 of the patterns are indicative of insecurity. Security increased as the strange situation became familiar and was evidenced initially when the mother was present. A field interpretation of the insecure situation is offered.

Performance of Hopi Indian Children on the Draw-a-man Test. WAYNE DENNIS, Louisiana State University.

Almost without exception it has been found that American Indians test below white norms on psychological tests. The poorer performance of Indians can be explained in terms of cultural handicaps. This is true even of those Indians groups which have been given non-language tests, since the performance required by non-language tests are often as unfamiliar to the Indian child as is the English language.

Among the Pueblo Indians of Arizona and New Mexico, however, graphic and plastic arts have been employed for centuries. The Pueblo child is acquainted with drawings on pottery and on ceremonial objects

and he engages in making pencil and crayon drawings at the government schools. In Goodenough's Draw-a-man Test, Pueblo children should have no environmental disadvantages.

With the cooperation of the government schools the test was given to all children of two Hopi mesas between the ages of 6 and 11 years, a total of 153 subjects. The average IQ of this group was 107. There is obviously no evidence of inferiority. It is suggested, however, that different Indian groups may differ markedly in ability.

The Relation of Individual Variability to Intelligence. SUSAN W. GRAY,
Florida State College for Women.

This study endeavors to reveal what relationship, if any, exists between individual variability in educational achievement and intelligence.

Subjects in this investigation were three groups of 200 children each, one group designated as of high intelligence upon the Kuhlmann-Anderson Tests, one of average intelligence, and one of low intelligence. For each child a measure of individual variability was found in the following manner: The scores of each child upon six subtests of the Unit Scales of Attainment were converted into standard scores based upon the child's deviation in sigma-units from the mean of his own class group. The sum of all possible differences with respect to these six scores was then found.

The relationship between individual variability and intelligence was studied by means of comparing measures of central tendency and dispersion for the individual variability scores of the three groups. With this technique a slight, but statistically significant, tendency was observed for the low group to show a greater average individual variability and also a greater dispersion of individual variability scores within the group. Differences between the high and average groups, however, were negligible.

The Personnel Testing Program of the Tennessee Valley Authority. R. E. DUNFORD, L. L. GRIFFEN, and SYDNEY ADAMS, University of Tennessee and the Tennessee Valley Authority.

The Tennessee Valley Authority is rapidly expanding its personnel testing program to include many of the annually rated positions in the clerical, administrative and fiscal, sub-professional and custodial series. In addition, tests are being used in the recruitment of candidates for apprentices in certain skilled trades and for an increasing number of annually rated positions in the trades and labor series.

The application of tests to the problems of recruitment and selection in the fields named has largely taken place in the last year and one-half. At present the tests have generally been used as selective or eligibility standards for beginning positions with entrance salaries at or below \$1440 per annum. It is planned to extend the use of tests where feasible to higher salary grades, probably not in excess of \$2300.

The tests used are designed to measure potentiality for development rather than achievement or knowledge about a specific kind of work. They are intended to measure general intelligence and interest in certain types of work as indicated by information. Test results are used to supplement existent techniques for application rating and selection of employees.

PHILOSOPHY

AXELL BRETT, Chairman

Some Implications between Religion and Democratic Equality. KENNETH K. BERRY, Webber College.

This paper takes the position that the democratic dogma "all men are created equal" is fundamentally religious. (It may also be scientifically demonstrable; but, even if it is, that is of less consequence in moving human wills to action.)

From this it follows that, if democratic equality is to be understood and intelligently fostered, we moderns must build a creed which avoids equal and opposite errors: on the one hand, complete separation of the transcendent and the immediate; on the other, their too easy identification. For, as Niebur has shown, the former leads to futility and the latter to complacency.

But this in turn will involve a reexamination of the meaning of freedom and of the end of man's existence.

The Postulate of an Impoverished Reality. IREDELL JENKINS, Tulane University.

It is the thesis of this paper that all distinctively modern thought, and so a large part of the complex structure of contemporary theory and practice, is based upon a single postulate. Hence, a great number of present day opinions, ideas, and attitudes have been derived from and depend upon this postulate. The contention here advanced is that this basic assumption consists in the postulate that reality and nature are poorer, more bare, than our experience of them. This assumption, which arose with Descartes and Bacon, states that nature can be explained entirely in terms of matter and motion; that these alone are real, and that all secondary and tertiary qualities, all values, ideals, and standards, are but constructions of the mind. The paper seeks to describe the historical origin of this postulate and to trace its growth, to analyze in detail just what it asserts and what it denies about nature, and to exhibit the subsidiary modes of thought that arise from this basic assumption. And, finally, it seeks to establish that many present confusions and uncertainties stem from this view, and that this postulate is obviously inadequate as a description of reality, and needs to be corrected.

The Use and Abuse of Words. HAROLD N. LEE, Tulane University.

We may take words too seriously because we do not recognize that they are only symbols. We may also take words too seriously because we emphasize too strongly their symbolic nature. In either case we are victimized. The evil effects of an over emphasis on semantics arise from directing our attention so closely to the symbolic nature that we neglect what is symbolized.

We can think of objects not physically present only by means of mental images or of symbols. Mental images are useless for the purpose of communication. Words supply an inexhaustible store of symbols that

we can have always available and upon which we can draw at will for purposes of thought or communication. A further difficulty of thought arises when we consider entities that have no separate physical existence. Without symbols, these could not be objects of thought at all. Most of the words in an extended vocabulary are symbols of such nonphysical realities. Without them, thought on any level of abstraction or generalization would be impossible.

But the fact that symbols are essential to thought and to philosophy gives us no reason to suppose that philosophy is the art of using symbols, as Carnap sometimes seems to suggest. Nor does it justify the view that the application of thought to action in such fields as politics is the art of the successful manipulation of symbols, as Stuart Chase and Thurman Arnold seem to imply. Such views are essentially anti-rational, anti-intellectual and anti-scientific.

Dewey's Substitute For "Natural Law." ROBERT W. BROWNING, University of North Carolina.

"Natural law" is here used in its moral connotation. Dewey's theory of valuation is considered as an illustration of the attempt by scientific procedures to provide determinations of what should be done. Though a positivist in the generic sense, Dewey is to be distinguished from most of contemporary positivism, both in theory of science and in approach to problems of value. For present purposes, his naturalistic teleology is of focal significance; the concrete substitute for "natural law" is that which is "required" to resolve the tensional situations. Specific direction is supposed to be found by examination of the "lacks of a situation." The procedure is left obscure. Most serious is the absence of treatment of the interlocking of situations and their respective "lacks." All men distributively may seek to resolve their confused situations; in a Darwinian scene, little light is thus afforded the direction of human affairs. Beside the tacit general moral assumption that needs should be met, there must be, for the resolution of mixed conflicting situations, priorities of some needs over others. Various statements by Dewey, none of them definitive, adumbrate different hypotheses; these are not more satisfactory than the historical models they suggest.

Friday Afternoon Session, April 3

PHILOSOPHY

EUGENE G. BUGG, Chairman

Symbolic Tonality & the Individual. PAUL ANGIER COMER, University of North Carolina.

This paper introduces the concept of "Symbolic Tonality" as that in the individual's make-up which is the condition of his receptivity and understanding. An endeavor is made to show the development of "Symbolic Tonality" by means of the interaction of the individual with nature and the complete social complex.

Symbolic Tonality as a causal factor in activity, as well as the place of mind, are discussed briefly with the view of suggesting the possibilities and limitations for individual freedom.

The concept presented has implications for the understanding of social problems and is, in this paper, applied in a brief exposition of class and regional division.

A Philosophic Study of Morale. ROBERT F. CREEGAN, Cumberland University.

Philosophy integrates human perspectives, and its own perspective is synoptic. A philosophy of Morale should harmonize many lines of evidence. Phenomenology describes Morale as an experience, in its existential aspects, and in its referential character. The existent feeling is always pervasive in a consciousness, and rather enduring. It is a mood, and, like all moods, broad in reference. Axiology investigates the value of Morale, and allows it a definite place in a hierarchy of values. Heretofore thought instrumental, Morale, also has a terminal value, and contributes in many intrinsic values. (Its relation to ethical, aesthetic, and religious activity are discussed, and then the ethical relation is given more detailed analysis.) An opposite to anxiety, Morale excludes hatred, which always implies anxiety. The infant knows neither anxiety nor Morale. These opposites are alternative felt attitudes towards a world, or the self's operations in a world. Ideal Morale expresses in feeling the conviction that existence is worthwhile as a totality, and that in detail it contains no single thing which is finally recalcitrant to the "good," and which, therefore, deserves absolute hatred. Some degree of love is accorded all creatures. Neither innate, nor universally learned, Ideal Morale crowns philosophic life quests.

The Fundamental Postulate of the Social Ethics of Hostos. MARJORIE S. HARRIS, Randolph-Macon Woman's College.

More than fifty years ago Eugenio María de Hostos warned that moral progress was not keeping up with material advancement. He believed with Socrates that knowledge is virtue; or, more specifically, that if the Americas could be taught to think and to understand the fundamental harmony of society with nature and of man with society, the western hemisphere would approach Utopian conditions. Was he too optimistic? No answer can be given until one understands the significance of his fundamental postulate.

The assumption that there is a preestablished harmony between man and nature and between society—made up of individuals—and man does not for Hostos point to a biological ethics. Man has a moral and an intellectual life as well as a physical life. Even to speak of the moral order is to distinguish it from the physical. And reason will freely subjugate itself to the moral law, which enjoins the practice of Stoic virtues. Of such a preestablished harmony, however, the will which is untutored by reason takes no account. Hence the man who follows the dictates of his will victimizes his world; "he does so much so badly in such a short time."

The "City of God" and the Democracy of the Future. ANNA FORBES LIDDELL, Florida State College for Women.

In this present war not only are our material possessions liable to destruction, our form of government has been attacked and the principle of life for which it stands. Our task is greater than the mere defense of territorial possessions or even the maintaining of a pattern of government. It is futile to fight for our lives if our lives are without value.

St. Augustine found the meaning of history in the progress of the spirit. Events are finally interpreted in terms of value. He saw that the man of good will can preserve his inner peace under the most adverse conditions because he can live in active hope and thus not only save himself from the world but build a better future for the world. This is not a device for personal escape, it is the only way to see beyond war to peace, beyond tyranny to freedom. Faith that the will of God can be done on earth as in heaven is manifested through the effort to reflect divine plan in political and social order. This provides the ideal which must underlie genuine democracy. Only as each individual comes to realize the eternal worth of every individual is actual democracy realized. But is not this the spiritual process which characterizes citizenship in the "city of God"? Men who live for spiritual and not for material good are the elect. When their number is sufficient the world will be transformed.

Maritain: a Quixote or a Socrates? GERARD HINRICHS, Xavier University.

Against the background of modern philosophy Maritain's advocacy of St. Thomas' philosophy is Quixotic.

The double theme of that background is that any philosophy is valid at most to its own age and that a supernatural orientation is inimical to the historic reasoned movement of philosophy.

Yet moderns confess the intellectual power of Maritain just where they feel themselves weak.

However, the comparatively limited philosophic fruitfulness of their naturalism and historical relativism prevents them from regarding Maritain's power as more than rhetorical.

PSYCHOLOGY

JOHN PAUL NAFE, Chairman

The Comparison of Conclusions from an Investigation of Motor Activities with the Conclusions of the Repeated Investigations. CHRISTINE B. SCARBOROUGH, Florida State College for Women.

One of the basic problems to which the data of an experiment on speed of movement contributed is that of the dependability of the common practice of drawing conclusions from a single well-controlled experiment in this field. The experiment was repeated for the purpose of comparing the conclusions based on the data of the initial experiment with those based on the data of the repeated experiment.

Speed of movement was measured with five tapping techniques under conditions found to be optimum in a preliminary investigation. One

hundred college women served as subjects. Thirty-five days later the same subjects repeated the tests under specified conditions identical with those of the initial experiment.

Analysis of the distributions of the two sets of data indicate insignificant change in the group scores from the initial to the repeated experiment. Correlational analysis yields coefficients ranging from $+ .486$ to $+ .944$. The individual changes least in the mere stereotyped activities. A comparison of the conclusions based on the two sets of data indicate the need for repetition of experiments in this field as well as the use of statistical standards.

Non-rewarded Performance in a Linear Maze. S. R. WALLACE, Jr. and ELIZABETH B. EDWARDS, Tulane University.

This is an investigation of the distribution of errors and running time in a maze which lacks a "goal." Forty-five albino rats, divided into three groups, were run in a linear, enclosed maze, having eight pairs of blinds perpendicular to the true path. Group I, the control group was given six daily trials with food in the last segment of the maze. Group II, the non-rewarded, removed group, was given ten daily trials with the same procedure as for Group I, save that there was no food in the maze. Group III, the non-rewarded, non-removed group, was given ten daily trials with the same procedure as for Group II, save that removal was from a chance point in the maze rather than from the end.

The non-rewarded groups provided evidence of learning and of a backward elimination of errors and an increase in speed of locomotion as the end of the maze was approached. However, these gradients tended to be reversed in the later trials of the removed group. Implications for the goal gradient hypothesis of reinforcement by unimpeded activity are discussed.

The Effect of Stereoscopic Presentation on a Reversible Configuration. JOSEPH WEITZ, Tulane University.

In an attempt to determine some of the central phenomena involved in reversible configurations, a stereoscopic presentation was used. One half of the stereoscopic slide was composed of four small sectors of thirty degrees each and the other side consisted of four large sectors each of sixty degrees. They were so drawn that with stereoscopic fusion a complete circle was seen with alternate small and large sectors. It was found that upon fixation of the center of the figure fluctuation occurred but in a somewhat different manner from that found by the usual methods of presentation of ambiguous figures. The alternation of the small and large sectors becoming figure is much more regular under the present conditions and further, the small sectors do not take figure precedence in this situation. A study is also made here of the effect of pre-fixation of one set of sectors and the influence of size and brightness changes of the sectors. An attempt is made to evaluate some of the current theories of perception in view of the results obtained.

A Neurovascular Theory of Cutaneous sensitivity. B. VON HALLER GILMER, Carnegie Institute of Technology.

Consideration is given to the theories and facts of cutaneous sensitivity. The theory proposed here is a modification of the Nafe vascular theory and is based upon recent experimental findings. The proposal is made that the highly innervated glomic units of the peripheral neurovascular system function differentially in mediating the cutaneous pressure and temperature qualities and some types of pain as well as serving a motor function in the regulation of body temperature.

The Effects of Vitamins and Mineral Supplements on Convulsive Seizures in Albino Rats. HARRY W. KARN and ROBERT A. PATTON, University of Pittsburgh.

Groups of albino rats, maintained on different but inadequate levels of vitamin B₁ intake, were tested regularly for convulsive seizures by exposure to a standard auditory stimulus. A paired-feeding technique was employed to control the caloric intake in all groups. During a 40 day experimental period all groups showed a rising incidence of seizures as the deficiency progressed. There was some evidence that a critical level of vitamin B₁ intake results in maximum sensitivity.

When other vitamin supplements in the B-complex group and certain mineral supplements were added to the diets of the animals there was a marked decrease in sensitivity during 40 additional days of testing.

A control group of animals allowed to feed ad lib on a balanced diet and receiving generous vitamin B₁ supplements was almost completely protected from seizures throughout the 80 day period of testing.

The results show that the nutritional state of the animal is an important determiner of seizure susceptibility. Therefore, great caution should be exercised in attributing seizures of this type to such factors as psychological conflict resulting from training on a discrimination problem.

This study was carried out in collaboration with C. G. King, Professor of Biochemistry at the University of Pittsburgh.

Color Blindness and Vitamins. KNIGHT DUNLAP and ROBERT D. LOKEN, University of California at Los Angeles.

Work in the Spring of 1941 revealed substantial improvement in color vision in eight color blind students, after administration of 25,000 units of vitamin A per day for 14 days, as compared with a matched control group of eight students.

Since this preliminary work, vitamin A in 25,000 unit daily doses has been recommended to 30 persons who wrote in from various parts of the United States because of inability to pass service tests with the Ishihara or Stilling charts. Of these, twenty show significant improvement, some being enabled to pass the tests in which they had previously failed. Control of actual dosage schedule is impossible for these cases.

Exploration with heavier dosages, and with addition of other vitamins is in progress.

Psychological and Physical Changes Accompanying Treatment of Hypogonadism. HERMON W. MARTIN, Emory University.

A clinical study, seeking to compare in terms of percentile positions the psychological and physical changes associated with sex-hormone treatment of a pronounced case of hypogonadism, is presented.

An undersized and apparently undernourished boy, approaching his seventeenth birthday was taken to the university hospital for respiratory complaints. The physical check-up showed marked underdevelopment of the sex characteristics, both secondary and primary. As treatment with Neo-Hombreol (testosterone propionate) was begun, the attending physicians invited the writer to follow the case and study any possible psychological effects that might accrue along with the possible physical results.

Several standardized measures of the personality were administered at intervals from September 1940 to July 1941, with a final check on the status of the boy in March 1942. The psychological changes found seem to be quite as definite and interesting as the physical.

Mental Deterioration Following Carbon Monoxide Poisoning. MILTON B. JENSEN, Louisville, Kentucky.

The subject, a man of 34, attempted suicide by carbon monoxide in November 1939 following which he was unconscious for about 72 hours and was hospitalized for two weeks.

As a child he was an excellent student, leading his classes through the elementary grades and high school. Intensive study of the piano was begun at seven or eight under the direction of his father, a skilled musician. His major ambition was to be a concert pianist, an ambition impinged upon him by his parents, particularly the mother, an ex-school teacher of pre-World-War-I Germany.

Following graduation from High school he studied at a Commercial School and then worked most of ten years as a private secretary and as a minor business executive.

Eighteen months after poisoning he simulated some schizoid personality disturbances which, upon further examination, proved to result from cerebral destruction.

Space perception was severely impaired and color vision virtually destroyed. Typing, playing the piano, matching colors, and working simple arithmetic problems were extremely difficult or impossible.

There were no hallucinations, no delusions, and orientation with respect to time and place was reasonably good.

Space perception has improved considerably during the past ten months, though color perception is unimproved. Neurological and psychological findings are presented.

Saturday, April 4

JOINT SESSION

FRITZ MARTI, Chairman

Basic Postulates Neglected in the Application of Standard Parameters to Empirical Samples of Biotic Data. CHRISTIAN PAUL HEINLEIN,

University of California at Los Angeles and Florida State College for Women.

A distinction is made between parameters and statistics. The properties and relations which characterize parameters commonly utilized in statistical methodology and normative science are described and the limits of their functions defined as basic postulates. In the description of biotic phenomena, the practical importance of correctly estimating appropriate parameters is stressed. The mathematical procedure of determining the parameter of best fit for a limited sample of biotic data is considered in some detail. The concepts of drift and kurtosis are related to methods of estimating the representativeness and consistency of biotic events. In the prediction of biotic properties from selected parameters, a primary distinction is made between incidental communality and causal efficacy and the relation between these modes and the dimension of time. Finally, the misapplication of standard parameters to empirical frames of reference is exemplified by practices current in psychological literature.

Universals and Immortality. ROBERT LEET PATTERSON, Washington, D. C.

In this paper I raise the question whether, if he reject Plato's theory of Forms as too obscure and too heavily weighted on the side of transcendence, the believer in universals as genuine realities *extra mentem*, can nevertheless construct an argument for the soul's immortality resembling the line of reasoning in the *Phaedo*. His epistemology posits value as objective, and as related to the self as its end. And if value be the end of the self, the self must be able to attain complete and permanent union therewith; that is to say it must be immortal, otherwise the result will be moral tragedy. The universe will then be evil, and evil is chaotic and parasitic in nature. It can be shown, however, that the universe is a system since the relation of causality, which directly or indirectly connects all entities, involves, as Professor Ewing has shown, logical entailment. In this system universals must be included. And the essence of system is harmony. The universe being thus systemic in character, evil cannot be predominant, but must be relatively superficial. But it will be predominant, as we have seen unless the soul be immortal. These considerations suffice to render immortality highly probable.

Psychology and Epistemology. HERBERT SANBORN, Vanderbilt University.

The traditional method in psychology, which was patterned after the abstract, mechanical, quantitative method of nineteenth century natural science, was unable to give adequate treatment to the fundamental problems presented to it for solution by ethics, aesthetics, and epistemology. Purpose and value were thought to be explained in terms of causality, which involved an equivocation and an *ignoratio elenchi*. Recently, under the influence of a reoriented natural science, certain schools of psychology have tended to be more concrete in their approach to these and other problems. The most recent of these, *Ganzheit* psychology, is attempting a thoroughgoing reinterpretation of psychological data from the point of view of total experiences. The result has been a more ade-

quate treatment of the problems of personality, leading to a considerable development of typology and characterology with the formulation of practical personality tests that constitute an important feature in the voluminous bibliography of war psychology of present day Germany. These schools suggest further possibilities of development in the direction of a philosophical psychology, whose general aim might be some validation of the hierarchies of purposive acts which constitute personality. The fact that any nexus of purposive acts may have gaps should be no more disturbing than the existence of missing links in every causal chain. One of the most important tasks of such a psychology would be the validation of the general conditions of thought and knowledge, which from the point of view of epistemology itself are purely theoretical or ideal.

Modern Science and the Exclusion of Teleology: The Contribution of Descartes. ALBERT G. A. BALZ, University of Virginia.

Descartes, in repudiating the employment of teleology in the sciences of nature, both recognized the temper of his age and determined the character of scientific inquiry. The questions arise: Upon what basis and under what intellectual auspices did Descartes effect the exclusion of finality? In what sense and to what degree is finalism really excluded and to what extent does finalism persist in a transformed sense? The argument of this paper is that the Cartesian attitude was fostered by conditions within Scholasticism itself and is at bottom an expression of Thomistic theses tacitly accepted by him.

PROCEEDINGS OF THE SEVENTEENTH ANNUAL
MEETING OF THE MIDWESTERN
PSYCHOLOGICAL ASSOCIATION

ROBERT H. SEASHORE, SECRETARY-TREASURER,
NORTHWESTERN UNIVERSITY

The Seventeenth Annual Meetings of the Midwestern Psychological Association were held at Hotel Statler, St. Louis, under the auspices of the Department of Psychology of Washington University, May 1 & 2, 1942. Dr. John P. Nafe, Chairman, and the other members of the department, were in charge of local arrangements. The formal sessions, arranged by the program committee, Dr. W. N. Kellogg, chairman, included 54 papers on: comparative psychology, psychological tests, human learning, social psychology, abnormal psychology, conditioning, personality, and physiological psychology. Symposium topics included learning, conditioning theory, problems of graduate students, education and psychology, motivation, industrial and vocational psychology, propaganda and morale, and psychology and the war.

At the annual banquet Dr. E. A. Culler of the University of Rochester acted as toastmaster. Dean R. F. Jones of the Graduate School of Washington University, gave the address of welcome. The address of the retiring president, Dr. James P. Porter of Ohio University, was on the subject "Psychology and the Functional Integration of Human Behavior." 228 persons registered at the meetings, a wartime decline of about one-third as compared to other years at other cities similarly located.

New officers elected for the fiscal year beginning October 1, 1941, were: President, Robert H. Seashore, Northwestern University (1942-43); Secretary-Treasurer, Dael L. Wolfe, University of Chicago, (1942-45); Members of Executive Council, Chester W. Darrow, Institute of Juvenile Research (1942-45) and Dean A. Worcester, University of Nebraska (1942-44) to fill unexpired term of former council member, Dael L. Wolfe.

The association accepted the invitation of the University of Michigan to meet at Ann Arbor during the last week end in April or the first week end in May in 1943, unless governmental emergency plans interfere.

PROGRAM

Friday, May 1, 9:00 A.M.

SESSION A. COMPARATIVE PSYCHOLOGY

JAMES P. PORTER, Chairman

Group Self-selection Maintenance as a Method in the Study of Food Preferences and Appetites. PAUL THOMAS YOUNG, University of Illinois.

Groups of rats maintained in "cafeterias" were offered a free choice among twelve dietary components. Each animal had an opportunity to select and balance his diet. Preference tests were run between pairs of the dietary components following controlled deprivations of the food elements.

The Hunger-thirst Equilibrium as Studied by the Preference Technique Under Conditions of Group Self-selection Maintenance. LEON D. SHAPIRO, University of Illinois.

Twenty-two rats were maintained upon a diet of powdered dog chow and distilled water. Preference tests were made between food and water following total deprivation periods of 4 to 144 hours. For all deprivations food was preferred to water. Probably the head receptors determined the choice.

The Equilibrium Between Carbohydrate and Protein Appetites as Studied by the Preference Method Under Conditions of Group Self-selection Maintenance. JAMES P. CHAPLIN, University of Illinois.

Groups of rats were maintained upon a self-selection diet of twelve components including sucrose (carbohydrate) and casein (protein). A preference test between sucrose and casein was run following deprivation periods ranging from 24 to 144. The carbohydrate was consistently preferred.

A Comparison of Efficiency of Two Types of Visual Discrimination Apparatus in Establishing Discrimination Habits in Hooded Rats. DONALD A. PETERSON, University of Chicago.

A new discrimination apparatus is compared in efficiency with the Lashley Jumping Apparatus. A brief description of the apparatus and problems used is given. The results indicate that the Lashley apparatus is more efficient on easy problems. Possible uses of apparatus and criteria for different purposes are discussed.

The Auditory Sensitivity of the Laboratory Rat. L. A. PENNINGTON and J. T. COWLES, University of Illinois.

Two groups of animals, trained by two different procedures, have yielded audiometric data pertaining to rodent sensitivity within the range of 64 to 11,584 cycles. Comparisons between the instrumental and classi-

cal conditioning methods in audition and between preoperative and post-operative sensitivity curves are reported.

Some Factors Which Inhibit the Abnormal Reaction to Auditory Stimulation.
NORMAN R. F. MAIER, University of Michigan.

In a group of experiments, the following factors were found to inhibit completely the abnormal reactions to auditory stimulation: (1) preliminary stimulation with an ineffective auditory stimulus, (2) repeated exposure to auditory stimulation regardless of whether seizures occur, and (3) lowering of body temperature and excessive muscular activity. The consequences of these findings are discussed.

The Role of Final and Sub-goals in Distance Discrimination by the White Rat. KENNETH W. SPENCE and G. ROBERT GRICE, State University of Iowa.

The present investigation reports data bearing on the inference recently put forward by Gilhousen to the effect that white rats discriminate differences in the lengths of alternative maze paths on the basis of sub-goals such as are provided by the beginning of the common final section of the path leading to the goal.

Delayed Discriminative Matching-from-sample by a Rhesus Monkey. BENJAMIN WEINSTEIN, University of Wisconsin.

Using the previously described matching-from-sample method, a monkey was trained in a delayed reaction problem. The subject examined two different samples—one movable, and one fixed. After 15-60 seconds with the objects out of sight, the subjects matched the movable sample from among five choice objects, and refrained from matching the fixed sample.

Friday, May 1, 9:00 A.M.

SESSION B. PSYCHOLOGICAL TESTS

FRED MCKINNEY, Chairman

The Optimum Use of Test Data. MAURICE LORR, U. S. Civil Service Commission, and RALPH K. MEISTER, Moosehart Laboratory for Child Research.

This paper presents a briefer and more efficient method of administering and scoring age scale tests of the Binet type. MA score is determined by the points at which the individual passes 50% of the items. Comparisons of the two methods are made for a sample of 100 cases.

Comparison of the Revised Kent Emergency Battery with the Revised Stanford-Binet and the Kuhlmann-Anderson Tests. FRANCES A. MULLEN, Bureau of Child Study, Chicago.

Suggestions for standardized administration and scoring of the revised emergency battery are given. Correlations of each component with accepted individual and group mental tests are presented. Norms derived by equating raw scores on each component to mental ages obtained from other tests are available.

The Improvement of Reading on the College Level by Means of a Practice Device. DEWEY B. STUIT, State University of Iowa.

The purpose of the study was to measure the effect upon reading achievement of: (1) exercises presented on the Buswell pacing machine and (2) the taking of weekly tests, without any other reading exercises. The groups used to investigate (1) both gained significantly but there was little difference between them. Groups used to investigate (2) showed no significant differences.

"Blind" Diagnoses on Several Personality Questionnaires Checked With Each Other and the Psychiatric Diagnoses. PAUL H. REED, DePauw University, and PHYLLIS WITTMAN, Elgin State Hospital.

Humm-Wadsworth comparisons are given for a control group of 217 and Elgin State Hospital population of 477. Comparisons of Humm-Wadsworth with psychiatric diagnoses are also given. "Normal" and Cycloid components differentiate controls from experimental groups. Schizoid, Hysteroid, and Epileptoid do not. "Normal" and Cycloid components coincide with psychiatric diagnoses. Other components do not.

The Thematic Apperception Tests. Qualitative Conclusions as to its Interpretation. D. RAPAPORT, Menninger Clinic, Topeka.

The clinical application of the Thematic Apperception Test is described. The principles of its interpretations are shown to rest on the degree of observance of the test instructions, on the identical strivings attributed to the phantasy figures described, and on the obvious misinterpretation of the test pictures.

The Coordination of the Speech Musculature of Stutterers and Non-stutterers. LOIS KRIEGMAN, Institute of Juvenile Research, Chicago.

A study was designed to test the hypothesis that there is no difference between stutterers and non-stutterers in rate of movement of the tongue, jaw, lips and fingers or in the ability to reproduce a temporal pattern of movement with these structures. The results of the experiment substantiated the hypothesis.

The Scaling of Word Attributes. C. HESS HAAGEN, State University of Iowa.

To provide learning materials with quantified degrees of relatedness in meaning, associative strength, and vividness, eighty series of five adjectives, related in meaning and paired with a common base word, were presented to judges who arranged the word-pairs along a seven point scale in terms of these three attributes.

Friday, May 1, 9:30 A.M.

1. SYMPOSIUM: LEARNING AND CONDITIONING THEORY

R. H. WATERS, Chairman

Friday, May 1, 9:30 A.M.

2. SYMPOSIUM: PROBLEMS OF GRADUATE STUDENTS

CHARLES C. GIBBONS, Chairman

Friday, May 1, 1:15 P.M.

SESSION A. HUMAN LEARNING

NORMAN R. F. MAIER, University of Michigan, Chairman

Error Gradients Around Success in Multiple-choice Learning. M. H. MARX and M. E. BUNCH, Washington University.

A further analysis of error repetition around success in multiple-choice learning indicates that success strengthens the earlier wrong responses to each nearby stimulus, and not merely the last wrong response (as found by Thorndike, Muenzinger, *et al*). This result also appears as a gradient, decreasing with distance in steps from success.

Level of Mastery and Reminiscence in Pursuit Learning. CLAUDE E. BUXTON, Northwestern University.

Subjects practiced to a criterion of 5, 20, or 35 per cent of the possible score on a single trial on the pursuit rotor. Their "recall" scores after a 10 min. rest are compared with scores for a matched no-rest group. Reminiscence is greatest at the moderate level of mastery before rest.

Human Learning on a Three-point Walking Maze. STANFORD C. ERICKSEN, University of Arkansas.

The subject is required to learn the correct sequence of moves between three platforms set eight feet apart. Data are presented on two topics: 1. Kinesthetic vs. ideational control in this type of path finding; 2. The extreme sensitivity of this habit to retroactive inhibition. Theoretical implications are discussed.

A Test of the Two-factor Theory of Retroactive Inhibition by Use of the Paired Associates Technique. B. J. UNDERWOOD, State University of Iowa.

A test of the two-factor theory of retroactive inhibition, using paired associates and two different criteria of original and interpolated learning, shows that while the differences between retroactive and proactive inhibition are statistically insignificant they are consistently in the direction that would support the two-factor theory.

Learning in Nursery School Children. HAROLD GULLIKSEN, University of Chicago.

Two different types of learning problems, i.e., a relative size discrimination, and a total size discrimination, have been given to twenty-four nursery school children. The data are analyzed in terms of parameters of the learning curves to show the relative difficulties of the two types of learning problems.

An Error Analysis of Serial Learning. R. H. WATERS, University of Arkansas.

The type and interrelationships of errors in serial learning are studied. Several types of errors are identified and the progressive changes in these errors with increasing practice are investigated. Most of the errors consist of the subject's making no attempt to anticipate. Extra-list and anticipatory errors are few in number. Implications for theories and character of serial learning are given.

Friday, May 1, 1:30 P.M.

SESSION B. SOCIAL PSYCHOLOGY

HARVEY C. LEHMAN, Chairman

Leadership and Social Acceptance in the College Classroom. ROY A. DOTY, Ohio State University.

Presents data gathered from five classrooms by means of specially prepared instruments to measure social acceptability, social distance, acquaintance, and leadership. The data are analyzed to show (1) the relation of qualities of leadership to social acceptability, (2) the basis of students' choice of leaders and participants in groups selected for different purposes, (3) the relationship of race, intelligence, academic record, emotional stability, degree of acquaintance, and personal characteristics to the two factors studied, and (4) the social structure of college classes.

The Mental and Social Development of Infants in Relation to the Number of Other Infants in the Boarding Home. HARRIET L. RHEINGOLD, Institute of Juvenile Research, Chicago, Illinois.

Twenty-five infants were examined in their boarding homes prior to adoption. About half were the "only" infants in the home. The "only" infants made a better social and emotional adjustment to the examiner and performed better on tests of mental, motor, and social development.

Democraticness, Autocraticness, and the Majority Point of View. THEO. F. LENTZ, Washington University.

The data presented in this paper consist of trait and item correlations between two variables: (a) Democraticness and (b) Majority-Mindedness. Findings lend weight to the assumption that the greater the degree of social adjustment of the individual, the greater the faith in the democratic way of life.

Attitude Toward American Participation in the European Conflict. E. T. KATZOFF, Illinois Civil Service Commission, and A. R. GILLILAND, Northwestern University.

Attitudes toward American participation in the European War varied greatly among colleges. It varied with political events and rose markedly at our entrance into war. The form of the curve representing distributions shifted from bi-modal to so called J curve to a normal distribution.

The Effect of Competition on the Performance of Tasks of Differing Degrees of Difficulty. DELOS D. WICKENS, University of Wisconsin.

College students performed arithmetic tasks of four different degrees of difficulty in a lone situation and later in a competitive situation. Results showed that the social motive of competition did not increase performance to the same extent at all levels of difficulty, but was less effective for the more difficult problems.

Determinants of Legislative Behavior in the U. S. House of Representatives.

JOHN C. EBERHART, Northwestern University.

In the United States House of Representatives the modal frequency of official legislative acts (introducing bills or resolutions, making speeches or motions, submitting petitions, etc.) is zero or near zero, and the frequency distributions are J-shaped. Principal determinants are committee responsibility, seniority, political needs, legislative obsessions, and time limitations.

Friday, May 1, 2:00 P.M.

SYMPOSIUM: EDUCATIONAL AND CHILD PSYCHOLOGY

WILLIAM CLARK TROW, Chairman

Friday, May 1, 2:00 P.M.

SYMPOSIUM: MOTIVATION

KENNETH W. SPENCE, Chairman

ANNUAL BUSINESS MEETING, 4:15 P.M.

ANNUAL DINNER (Informal) 6:00 P.M.

E. A. CULLER, Toastmaster

Address of Welcome: Dean R. F. JONES, Graduate School, Washington University.

Presidential Address: JAMES P. PORTER, Ohio University.

Subject: "Psychology and the Functional Integration of Human Behavior."

Saturday, May 2, 9:00 A.M.

SESSION A. ABNORMAL PSYCHOLOGY

JOHN J. B. MORGAN, Chairman

A Preliminary Study of the Childhood Behavior Patterns of Institutionalized Psychotic Patients. JAMES E. BIRREN, Northwestern University, and PHYLLIS WITTMAN, Elgin State Hospital.

Childhood behavior patterns of 50 individuals comprising the different diagnostic groups of psychoses were examined to ascertain whether or not they evidence a similarity of personality in childhood. The purpose of this study was to evaluate the efficacy of an historical approach to per-

sonality as a diagnostic and prognostic aid, as applied to psychotic patients.

A Psychometric Pattern Study of the Relationship Between Social Adjustment and Behavior Efficiency. SIDNEY W. BIJOV, Wayne County Training School.

Actual accounts of the social adjustment of 164 mentally retarded young men who had been separated from the Wayne County Training School for an average period of six years were rated. Pattern analysis of psychological and educational test results showed that only behavior efficiency measures are related to levels of social adjustment.

Characteristic Psychographs of Mental Efficiency for Various Psychiatric and Chronological Age Classifications. PHYLLIS WITTMAN, Northwestern University and Elgin State Hospital.

An initial psychometric examination is given routinely to all patients (cooperative enough to answer any questions) within the first two weeks of their admission to the Elgin State Hospital. This paper presents test results for 5,146 psychotic patients and 398 non-psychotics, together with a discussion of the results and possible interpretations.

Some Psychological Effects of Bilateral Prefrontal Lobectomy. HOWARD F. HUNT, University of Minnesota.

Bilateral prefrontal lobectomy was performed on two female psychiatric patients. Extensive pre- and post-operative psychological examinations were given these patients, and comparisons between the results of these two sets of examinations will be discussed.

Mental Efficiency Levels Before and After Fever Therapy in Syphilitic Meningoencephalitis. MARY MUNSON, Elgin State Hospital.

Following therapy there was improvement on the average in every measurement used. On some of the individual tests of the Wechsler-Bellevue the difference was not significant. However, of verbal, performance, and total I.Q.'s, the difference between the before-treatment and after-treatment scores was highly reliable. The results on the Babcock Scale followed closely those for the Wechsler-Bellevue. The improvement in cooperation, although not great, was significant, and showed definite agreement between the psychologist's and psychiatrist's ratings.

A Further Validation of Role Therapy. ALEXANDER J. ROBINSON and GEORGE A. KELLY, Fort Hays Kansas State College.

The present study has shown simplified ways for the clinician to derive the role to be used in "role therapy" and to validate it before it is tried out on the patient. The five role-dramatizing sessions have been reduced to a standard form.

Studies in Psychosomatics: the Influence of Hypnotic Responses on Gastric Hunger Contractions. JULIAN H. LEWIS and THEODORE R. SARBIN, University of Chicago.

This preliminary study is concerned with the influence of hypnotic suggestion upon gastric hunger contractions. In addition to two types of control situations, hypnotic sessions were devoted in attempting to eliminate hunger contractions from an active stomach and to induce contractions in a quiescent stomach.

Saturday, May 2, 9:00 A.M.

SESSION B. CONDITIONING

E. A. CULLER, Chairman

A Simple Conditioning Interpretation of Discrimination Learning. GEORGE W. BOGUSLAVSKY, University of Chicago.

A comparison of the Lashley jumping apparatus and the Chicago unorientational maze has revealed the inadequacy of punishment if applied in a situation different from that in which the response occurred. The apparatus providing an opportunity for correcting a wrong response in the presence of the stimulus is most conducive to rapid learning.

Effects of Negative Reinforcement. WILLIAM K. ESTES, University of Minnesota.

Two effects of punishment upon a conditioned operant response were demonstrated: (1) a temporary inhibition, varying with amount of punishment, and attributable to emotional conditioning; and (2) a modification of the total height of the extinction curve, negligible for mild punishment and reaching significance only for protracted severe negative reinforcement.

Sensitization and Association in Eyelid Conditioning. DAVID A. GRANT, University of Wisconsin.

Eyelid responses to light were compared following conditioning, pseudo-conditioning, and visual fixation procedures. The pseudo-conditioning and fixation procedures resulted in increases in the frequency of eyelid reactions comparable to those resulting from conditioning. The conditioned responses tended to differ from the non-associative responses in amplitude, duration, latency, and overnight retention.

Tests of Sensory Pre-Conditioning with Human Subjects. W. J. BROGDEN, University of Wisconsin.

Sensory pre-conditioning was investigated by pairing tone and light, then making the light a conditioned stimulus for the galvanic skin response, and following this with the tone alone. No consistent evidence of sensory conditioning was obtained when the results of the experimental group were compared with those of three control groups.

Two Types of CR's in Flexion Conditioning. N. H. PRONKO and W. N. KELLOGG, Indiana University.

When dogs are conditioned by the pairing of 2 electric-shock stimuli, a kind of muscle twitch appears in the conditioned member which is distinct both from the usual flexion CR and from the unconditioned reflex.

This type-T (twitch) CR differs in amplitude, latency and frequency from the type-L (regular) CR.

Discrimination Learning Without Primary Reinforcement. HARRY F. HARLOW, University of Wisconsin.

Three Rhesus monkeys were given preliminary training in which they learned to solve discriminations following a single reinforcing trial. In the experiment proper the animals solved a series of problems requiring selection of the correct member of a pair after being shown only the positive object. Positional and secondary cues were controlled.

The Effect of a Discrimination Stimulus Transferred to a Previously Unassociated Response. KATHERINE C. WALKER, University of Minnesota.

A stimulus which had been the basis of a discrimination for rats running a straightaway showed a similar discriminative effect when first paired with a lever-pressing response associated with the same drive.

Facilitation of the Unconditioned Response By the Conditioned Stimulus in Buzzer-shock Conditioning of Rats. J. DONALD HARRIS, University of Rochester.

Amplitude of response to a series of 10 shocks a day for 10 days shows from day to day a typical negatively accelerated decrement. Unconditioned responses to shock during conditioning, however, increase in amplitude until the conditioning group responds to the shocks half again as much as the shock-alone group.

Saturday, May 2, 9:30 A.M.

SYMPOSIUM: INDUSTRIAL AND VOCATIONAL PSYCHOLOGY

ARTHUR G. BILLS, Chairman

Saturday, May 2, 9:30 A.M.

SYMPOSIUM: PROPAGANDA AND MORALE

A. R. GILLILAND, Chairman

Saturday, May 2, 1:15 P.M.

SESSION A. PERSONALITY

CARLYLE JACOBSEN, Chairman

Evaluation of Educational Goals and Achievement. STANLEY S. MARZOLF, Illinois State Normal University.

To determine if there is any relationship between achievement and the manner of rating 61 statements of educational outcomes, 154 freshmen in psychology rated these statements on an eleven-point scale of worthwhileness. The manner of rating was compared with the point-hour-ratio and slight positive relations were found.

The Physiological Conception and Treatment of Certain Anxiety States.
EDMUND JACOBSON, Laboratory for Clinical Physiology, Chicago.

Tension patterns in the neuro-musculature characterize anxiety states. These can be recognized externally in the facies and elsewhere and internally as spasticity in parts or the whole of the alimentary tract and other viscera. The evidence indicates that the tensions are essential rather than mere "accompaniments" of the anxiety state.

A Projective Method of Personality Investigation. FRANCIS BISHOP and
GEORGE A. KELLY, Fort Hays Kansas State College.

A diagnostic personality inventory constructed from the presupposition that people identify themselves with strong characters in stories they read. A series of story plots are presented in which the subject selects the solution of the conflict. Solution selected indicates nature of maladjustment. Validated by independent diagnosis using other clinical techniques.

The Place of War Toys in the Present Emergency. MARTIN I. RAYMERT,
The Mooseheart Laboratory for Child Research.

In view of the non-existence of research on the effect of war toys on children, the author constructed and sent out to a selected group of clinical and child psychologists an opinion questionnaire in order to get some general indication of their views in this matter. The returns from the questionnaire are presented and analyzed.

Swindlers: Their Principal Techniques of Motivation and their Foremost Personal Traits. J. E. JANNEY, Western Reserve University.

A poll of Better Business Bureaus indicates that *confidence*, *cupidity*, *conceit*, and *concealment* are the principal motivational techniques. Minor techniques include appeals to superstition, the accepted virtues, civic pride, the desire for health and beauty, prestige suggestibility, and "take a chance." Large operators tend to be socially-emotionally more mature than small operators.

The California Personality Scale as a Diagnostic Instrument. ALAN ROSEN-
WALD, Jacksonville State Hospital and Northwestern University.

This scale was given to schizophrenic and manic depressive patients and an adequate control group. It failed to differentiate the psychotic groups or show significant differences between experimental and control groups. The low positive correlation with an apparently valid prognostic scale indicates its undesirability as an aid in psychiatric diagnosis.

Saturday, May 2, 1:15 P.M.

SESSION B. PHYSIOLOGICAL PSYCHOLOGY

JOHN P. NAFE, Chairman

Some Indices of Deception for the Interpretation of Polygraph (Lie Detector) Tests. PAUL V. TROVILLO, Chicago Police Scientific Crime Detection Laboratory.

Polygraphic test recordings of subjects examined at a Crime Detection Laboratory (whose status as to guilt or innocence were subsequently verified) were canvassed to secure twenty-three indices of deception of three types: eleven—Blood Pressure; six—Respiratory (Keeler Polygraph); and six—Electrodermal (Charles M. Wilson recording Psychogalvanometer).

Patterns of Muscular Activity During Simple Voluntary Movement. R. C. DAVIS, Indiana University.

Simple voluntary movements involve widespread patterns of muscular activity which show an inverse proportionality to distance from focus, or some function of it. These patterns differ in decrement with distance for different movement locations, and for movements of different force.

Reflex Changes During Narcosis Recorded in Electrical Units. W. N. KELLOGG, C. R. HEADLEE, and N. H. PRONKO, Indiana University.

The strength of the electric-shock stimulus necessary to maintain a flexion reflex of constant amplitude in laboratory dogs was continuously recorded (1) after injections of Nembutal and (2) in the normal state. The method gives an indirect measure of the change in effectiveness of a depressing drug over a period of time.

Changes in the Energy of the Alpha Band of the Electroencephalogram Following Stimulation. JOHN R. KNOTT and HOWARD D. HADLEY, State University of Iowa.

Quantitative measures of changes in energy of the alpha rhythm following auditory stimulation (180 cycle tone) indicate great variation in such changes. These show no consistent trends from subject to subject, but for any given subject variations appear which may be related to other data previously reported.

Changes in the Frequency-Energy Spectrum of the Electroencephalogram from Birth to Twenty-Four Years. FREDERIC A. GIBBS, Harvard Medical School, and JOHN R. KNOTT, State University of Iowa.

From Fourier transforms of the right occipital electroencephalograms of 531 male subjects ranging in age from birth to 24 years, a series of energy vs. age curves have been plotted for 28 frequency bands. The data indicate those regions of the electroencephalographic spectrum best suited to psychophysiological correlation.

Pupil Behavior in Some Situations of Ocular Discomfort. S. HOWARD BARTLEY, Washington University.

A study of pupillary response by infra-red photography. The results demonstrate the organism's attempt to resolve stimulus conflicts. In one case, the pupil tends to minimize the effect of strong peripheral stimulation; and in the other, definite discomfort is induced through the inability of the motor and perceptive mechanisms to coincide.

Saturday, May 2, 3:15 P.M.

SYMPOSIUM: PSYCHOLOGY AND THE WAR

DAEL L. WOLFLE, Chairman

PROCEEDINGS OF THE THIRTEENTH ANNUAL MEETING OF THE EASTERN PSYCHOLOGICAL ASSOCIATION

HARRY HELSON, SECRETARY, BRYN MAWR COLLEGE

The Thirteenth Annual Meeting of the Eastern Psychological Association was held on April 17-18, 1942, at the Biltmore Hotel, Providence, R. I., under the auspices of the Department of Psychology of Brown University. Due to war conditions attendance dropped 45% from previous years with 185 members and 171 guests, a total of 356. But what the meeting lacked in size it made up in other ways, particularly in the great interest in the relations of psychologists and psychology to the war effort. Both contributed and invited papers show that interest in war applications is great and psychologists are entering directly into war activities to an unprecedented degree. On the other hand this meeting proved that research activities are still going on and should continue both for the sake of the war effort and for the post-war period to follow. During such a period as we are now passing through the function of scientific associations such as this is perhaps best realized: to keep alive interest in research of pure and applied intent through meetings where reports of progress may be heard and discussed. If some research is continued during the war period psychologists in the post-war era will have a basis on which to resume peace-time scientific activities. It was perhaps something of this sort in mind which prompted the Program Committee "to thank those participants who did succeed in getting to the meetings despite war responsibilities and other difficulties."

The number of contributed papers, 65 this year as against 73 in 1941, showed only a slight falling off. Two Round Tables were held of the three scheduled, one film session and the general session completing the program of invited and contributed papers. An extra session called at the meeting to get first-hand information regarding selection of psychologists for their type of work in the war effort was addressed by two individuals in the key organizations for this purpose: Leonard Carmichael of the National Roster of Scientific and Specialized Personnel and Steuart H. Britt of the Office of Psychological Personnel. This meeting served the purpose of getting much-needed information to psychologists anxious to co-operate more actively with war agencies.

This year the custom was followed of having the last retired President of the Association act as Toastmaster at the Presi-

dential Dinner and Address. This function was performed by W. S. Hunter who introduced H. M. Wriston, President of Brown University, who welcomed the Association to Providence and Gardner Murphy, President of the Association who spoke on: "Psychology and the Post-War World." The address was notable in showing that psychologists, trained and equipped for interdisciplinary problems, would be called upon to help solve the numerous problems of the peace no less than the problems of war which now engage so many.

Elections and Appointments. Officers were elected to serve as follows: President, Gordon Allport, Harvard University, 1942-43; Secretary, Theodora M. Abel, Letchworth Village, 1942-43, to fill out the unexpired term of Harry Helson, resigned; Board of Directors, Gardner Murphy and Otto Klineberg, Columbia University, 1942-45. The Board appointed as member of the Program Committee Kurt Goldstein of Tufts Medical School for 1942-45, and as the Auditing Committee for 1942, Fred Keller and George Hartmann, Columbia University.

The following actions were taken at the Annual Business Meeting:

(1) Proceedings of the 1941 Meeting as printed in the *Psychological Bulletin* were accepted.

(2) The reports of the Secretary and of the Treasurer were accepted and a budget totalling \$860.00 was adopted for the year 1942-43.

(3) The sum of \$100.00 was voted to the Secretary and the sum of \$50.00 to the Treasurer to defray expenses and as a stipend.

(4) Seventy-six applicants for membership were taken into the Association on recommendation of the Board of Directors.

(5) It was voted to continue the Clearinghouse of Information relative to job placement for another year with a Committee consisting of Barbara Burks, A. H. Maslow, and Theodora M. Abel, Secretary, as Chairman. The sum of \$100.00 was allocated to defray expenses incidental to the operation of this project.

(6) A resolution to the effect that dues of members in the armed forces be remitted during their period of service was approved.

(7) The invitation of the Department of Philosophy and Psychology of Hunter College for the Association to hold its annual meeting in 1943 at that institution was accepted with thanks. Owing to war conditions it was necessary to cancel the Lehigh meeting scheduled for next year. The meeting will be held at Hunter College during the Easter holiday in 1943.

(8) A resolution thanking the Local Committee and Administrative Officers of Brown University for providing for the requirements of the annual meeting at a time when the demands of war increase the difficulty of serving as hosts to a large and critical organization was unanimously approved.

The financial statement for the fiscal year, 1941-42, prepared by the Treasurer and verified by the Auditing Committee is as follows:

FINANCIAL STATEMENT AS OF MAY 1, FOR THE
FISCAL YEAR 1941-42

Income

Membership Dues	
Dues for current year (1941-42).....	\$ 448.00
Dues paid by applicants.....	71.00
Arrears.....	84.00
Dues paid in (1942-43).....	\$ 10.00
	<hr/>
Total Dues.....	\$ 613.00
Guest fees for 1941-42.....	137.00
Interest on savings account.....	19.50
	<hr/>
Total Income.....	\$ 769.50

Expenditures

Publication of 1940-41 <i>Proceedings</i>	\$ 19.14
Clerical assistance to Secretary.....	100.00
Clerical Assistance to Treasurer.....	100.00
Treasurer's bond.....	5.00
Travelling expenses of officers.....	15.44
Postage, express, telephone.....	104.47
Printing.....	148.61
Mimeographing, miscellaneous clerical.....	12.59
Stationery and supplies.....	17.55
Local expenses of Providence meeting.....	37.60
Clearinghouse correspondence.....	15.42
	<hr/>
Total Expenditures.....	\$ 575.82
Surplus for 1941-42.....	193.68

Balance Sheet

Cash: Fifth Avenue Bank of N. Y.....	\$ 563.13
New York Savings Bank.....	1241.47
Petty Cash: Secretary.....	20.00
Petty Cash: Treasurer.....	20.00
	<hr/>
Total Cash.....	\$1844.60
Capital: As of May 1, 1941.....	\$1650.92
Surplus, 1941-42.....	193.68
	<hr/>
Total Capital.....	\$1844.60

The program of the meeting was as follows:

EDUCATIONAL PSYCHOLOGY AND MEASUREMENT

EDNA HEIDBREDER, Chairman

- A Case of a So-called Idiot Savant.* KURT GOLDSTEIN, Tufts College.
- The Effect of Money-Incentive versus Praise upon the Reliability and Obtained Scores of the Revised Stanford-Binet Test.* S. P. KLUGMAN, University of Pennsylvania.
- School Achievement as Related to the Sub-Divisions of the Stanford-Binet Intelligence Test.* J. F. GARRETT, New York University.
- Two New Measures of Reading Ability.* F. B. DAVIS, Cooperative Test Service, New York.
- Own Estimate in Relation to Objective Measurement.* SETH ARSENIAN, Springfield College.
- Rorschach Signs in the Selection of Efficient Mechanical Workers.* Z. PIOTROWSKI, B. CANDEE, and Associates, National Youth Administration, New York.
- An Experimental Analysis of Sequences of Restricted Verbal Associative Responses.* W. A. BOUSFIELD, University of Connecticut.
- Selection of the 100 Greatest Books.* DANIEL STARCH, New York.

AUDITORY FUNCTIONS

E. G. WEVER, Chairman

- Comparative Thresholds of Pitch and Intensity in Rat, Dog, and Man.* WILLIAM ECCHER, University of Rochester.
- Interference and Distortion in the Cochlear Responses of the Pigeon.* C. W. BRAY and W. R. THURLOW, Princeton University.
- On the Frequency-Response of the Cochlea.* E. A. CULLER, University of Rochester.
- The Effect of Lesions at Various Levels of the Auditory System upon Hearing and Conditioning in the Cat.* K. D. KRYTER, University of Rochester.
- Frequency-Localization in the Auditory Cortex of the Monkey.* J. B. LICKLIDER, Swarthmore College, and K. D. KRYTER, University of Rochester.
- Auditory Acuity in Monkeys after Destruction of the Auditory Cortex.* R. L. FRENCH, Yale University.

ANIMAL PSYCHOLOGY

R. M. YERKES, Chairman

- The Effect of Phenobarbital on Food and Water Intake, Activity Level, and Weight Gain in the White Rat.* M. R. JONES, Cornell University Medical College.
- Masculine Mating Behavior in the Female Rat.* PRISCILLA RASQUIN, American Museum of Natural History (Introduced by F. H. Beach).
- Confirmation of the Effects of Infantile Feeding-Frustration upon Adult Hoarding in the Albino Rat.* J. McV. HUNT and H. SCHLOSBERG, Brown University.
- Studies of Infantile Feeding-Frustration: The Effects of Shortening the Adult Feeding Frustration on Hoarding.* E. STELLAR, and R. L. SOLOMON, Brown University.

Behavioral Contrasts in an Infant Chimpanzee Reared from Birth in a Human Family Environment. GLEN FINCH, Yale University (Introduced by H. W. Nissen).

PERSONALITY

R. S. WOODWORTH, Chairman

Expressive Movements and the Projective Technique in Personality Analysis.

E. M. LIGON, Union College.

A Projective Technique for the Study of Aggression in Young Children.

L. J. STONE, Vassar College.

Mental Development of Fifty Children from Birth to Ten Years of Age.
HELEN THOMPSON, New York Post-Graduate Medical School and Hospital.

An Investigation of Some Aspects of the Topology of the Hypnotic State.
M. BRENNAN, The Menninger Clinic (Introduced by Harry Helson).

The Horn-Hellersberg Personality Test for Testing Adaptation to Reality.
ELIZABETH HELLERSBERG, Brooklyn College (Introduced by G. W. Allport).

A Survey of Attitudes and Activities of Fathers. L. P. GARDNER, Cornell University.

PHYSIOLOGICAL PSYCHOLOGY

DONALD B. LINDSLEY, Chairman

Conditioned Responses in Cats after Removal of the Visual Areas of the Cortex. GLEN RAYSON, University of Rochester (Introduced by E. A. Culler).

Experiments on the Electrical Excitability of the Eye. H. D. BOUMAN, University of Rochester.

Functions of the Forebrain in the Mating Behavior of the Male Pigeon.
F. A. BEACH, American Museum of Natural History.

*An Analysis of Reproductive Behavior in the Male Fish, *Tilapia macrocephala*, and its Modification by Forebrain Injury.* L. H. ARONSON, American Museum of Natural History (Introduced by F. A. Beach).

Effects of Cortical Lesions upon the Reproductive Behavior of the Male Cat.
ARTHUR ZITRIN, American Museum of Natural History (Introduced by F. A. Beach).

PERCEPTUAL FUNCTIONS

S. W. FERNBERGER, Chairman

Initial Visual Experience in Rats. MUNGO MILLER, Princeton University.

Inter-Relating Conditions Determining Lightness Constancy. HARRY HELSON and R. W. BORNEMBEIER, Bryn Mawr College.

Similarity as a Factor in the Organization of Visual Patterns in the Cat.
W. D. NEFF and WOLFGANG KÖHLER, Swarthmore College.

The Pain Threshold for Electrical Stimulation. L. H. LANIER, Vassar College.

Preliminary Description of a Method for the Measurement of Anomalous Color Vision. DEAN FARNSWORTH, New York University.

Experiments in Comprehending. MORITZ LOWI, Connecticut College
(Introduced by John Seward).

CLINICAL PSYCHOLOGY

ELAINE F. KINDER, Chairman

- Underlying Principles in Psychological Analysis.* HARRIET BABCOCK,
Vocational Adjustment Bureau, New York City.
- Importance of Sensory Training in Speech Therapy.* S. D. ROBBINS,
Emerson College.
- Tests as Diagnostic Instruments in Clinical Practice.* C. P. ARMSTRONG,
Psychiatric Clinic, Domestic Relations Court, New York.
- A Study of Relationships between Performance on Eight Non-Language
Tests and Ratings of Needlework Ability of Subnormal Girls.* E. F.
KINDER, Rockland State Hospital, and VIVIAN FRUCHTBAUM, Letch-
worth Village.
- A Preliminary Report Concerning Group Effects upon the Performance of
Schizophrenic Patients.* A. I. RABIN, New Hampshire State Hospital.
- A Psychometric Study of Various Types of Schizophrenic Patients.* A. D.
GLANVILLE, University of Maine.
- The Norwich Rating Scale: Its Reliability and Usefulness.* L. H. COHEN,
R. B. MALMO and T. THALE, Norwich State Hospital.
- Changes in the Libidinal Interest of Schizophrenic Patients Produced by
Testosterone and Measured by the Photoscope Technique.* SAUL ROSEN-
ZWEIG, Worcester State Hospital.
- Mental Tests as an Aid in Differential Diagnosis, Particularly in Distin-
guishing between Cerebral Pathologies and Psychogenic Disorders.*
GLADYS TALLMAN and LOUISE HEWSON, Neurological Institute.
- The Value and Limitations of the Neurotic Signs.* M. R. HARROWER-
ERICKSON, University of Wisconsin.

LEARNING AND CONDITIONING

WALTER S. HUNTER, Chairman

- The Temporal Factor in the Resolution of a Conflict.* ALBERT ULLMAN,
Harvard University (Introduced by O. H. Mowrer).
- Extinction and Behavior Variability as Functions of Effortfulness of Task.*
H. M. JONES, Harvard University (Introduced by O. H. Mowrer).
- A New Method of Establishing Avoidance Responses.* R. R. LAMOREAUX,
Harvard University (Introduced by O. H. Mowrer).
- Avoidance Conditioning and Signal Duration.* O. H. MOWRER, Harvard
University.
- Reinforcement as an Associative Process.* J. P. SEWARD, Connecticut Col-
lege.
- The Use of Latency of Response as a Measure of the Acquisition and Gen-
eralization of a Discrimination.* R. L. SOLOMON, Brown University.
- The Effect of Distribution of Re-learning on Serial Verbal Discrimination
Habits.* D. C. MCCLELLAND, Connecticut College.
- A Case of Amnesia and Its Bearing on the Theory of Memory.* M. GILL and
D. RAPAPORT, The Menninger Clinic (Introduced by Harry Helson).

Conditioned Stimulus Intensity and Response Magnitude. Karl Zener, Duke University (Introduced by Harry Helson).

SOCIAL PSYCHOLOGY

CARROLL C. PRATT, Chairman

Propaganda and Morals. S. S. SARGENT, Barnard College.

The Effect of Rehousing on Morale. J. M. SEIDMAN, Brooklyn College.

The Development of a Multiple Primary Social Attitude Scale. L. W. FERGUSON, University of Connecticut.

"Positive" and "Negative" Projection Stemming from "Inferior" and "Superior" Norms. T. E. COFFIN, Hofstra College.

The Quantitative Treatment of Categorized Data on Social Conformity and Other Bi-Polar Traits. JOSEPH ZUBIN, New York State Psychiatric Institute.

A Preliminary Approach to the Problem of Social Aggression. ROSS STAGNER, Dartmouth College.

Conflict, Frustration and Threat. A. H. MASLOW, Brooklyn College.

Dominant Behavior of Institutionalized Subnormal Negro Girls. T. M. ABEL, Letchworth Village.

A Study of Cooperation, Dominance and Other Social Factors in Monkeys. WILLIAM GALT, The Lifwynn Foundation, and C. J. WARDEN, Columbia University.

Sexual Status and Degree of Hunger in Chimpanzee Competitive Interaction. VINCENT NOWLIS, Yale University.

FILMS

J. McV. HUNT, Chairman

Aggression and Destruction Games: Balloons-Demonstration of a Projective Technique. L. J. STONE, Vassar College.

A Study of Child Development. L. PEARL GARDNER, Cornell University.

An Experimental Study of Reproductive Behavior in the Male Frog, Rana Pipiens. L. R. ARONSON, American Museum of Natural History.

Sexual Behavior in the Rat, with Experimental Reversal of the Mating Patterns of Both Sexes. F. A. BEACH, American Museum of Natural History.

Double Alternation Bar Pressing in the Rat. HAROLD SCHLOSBERG, Brown University.

ROUND TABLES

Experimental Approach to Psychoanalytic Doctrine. BELA MITTELMANN, Chairman. Participants: MARGARET BRENNAN, FELIX DEUTSCH, DAVID M. LEVY, HOWARD S. LIDDELL, DAVID RAPAPORT and ROBERT S. SEARS.

The Rorschach Test and Its Military Applications. BRUNO KLOPFER, Chairman. Participants: M. R. HARROWER-ERICKSON, MARGUERITE R. HERTZ and M. RICKERS-OVSIANKINA.

PRESIDENTIAL ADDRESS

Psychology and the Post-War World. GARDNER MURPHY, College of the City of New York.

GENERAL SESSION

GARDNER MURPHY, Chairman

Psychology and the National Emergency. LEONARD CARMICHAEL, Tufts College.

Psychology of Sensation and Perception: Its Importance in the War Effort. E. G. BORING, Harvard University.

Projective Methods in Psychology. H. A. MURRAY, Harvard University.

PROCEEDINGS OF THE TWENTY-SECOND ANNUAL MEETING OF THE WESTERN PSYCHOLOGICAL ASSOCIATION

RALPH H. GUNDLACH, SECRETARY-TREASURER,
UNIVERSITY OF WASHINGTON

The twenty-second annual meeting of the Western Psychological Association was held at the University of Washington on Friday and Saturday, June 26 and 27, 1942. There was a very small meeting, due to the fact that many persons were called away by war work, and due to the fact that the distance to Seattle from other parts of the coast, and the current rubber shortage, discourages travel. About 40 persons attended the meetings, and 16 papers were delivered at the 3 sessions.

The treasurer reported as of January, 1942, a carry-over of \$38, dues received \$104, a total expenditure of \$87 leaving a balance of \$55.

The question of the sequence of meeting places came up, and was again reformulated. Over the last 10 year period, the relative distances that all persons who attended the meetings would have to travel to reach our various meeting places would be of this order: Bay region, 12; Los Angeles region, 18; Eugene, 24; Seattle, 36. Consequently the policy of the Association was re-affirmed that we meet, say, during the odd numbered years in the Bay area; and for the even numbered years, alternately between the Los Angeles area and the Northwest.

Officers elected for the coming year were: President—Jean Macfarlane, Institute of Child Welfare, University of California; Vice-President—William Griffith, Reed College; Secretary-Treasurer for a three year term—Lester F. Beck, University of Oregon. The Association is scheduled to meet next year in the Bay area, probably June 18 and 19, 1943.

President E. R. Hilgard having resigned to take a post in Washington, D. C., Vice-President Howard C. Gilhousen gave the address at the annual banquet. His topic was "Motivation and Morale."

PROGRAM

Friday Morning, June 26

WARNER BROWN, Chairman

Choice Time as a Measure of Individual Differences in Serial and Discrimination Learning Problems. DOUGLAS LAWRENCE, University of Washington. (Introduced by E. A. Esper.)

A group of 45 subjects learned a 16 move series on a polytactic maze. Individual moves were timed on every other trial. During the initial trials, these measures were negatively correlated with the trials required to reach the criterion. A comparison of the ten best and the ten poorest learners showed significant differences between the groups in the relative time spent on moves of comparable difficulty, in the relative amount of time spent in making a move and in hesitation after a move, and in the rate at which their speed of movement increased from trial to trial. During the criterion runs, the poor learners were performing in a manner analogous to that of the good learners initially. A similar analysis is being undertaken of the choice times on a discrimination problem employing verbal material.

A Modified Procedure for the Abbreviated Revised Stanford-Binet Scale in Determining the Intelligence of Mental Defectives. CLARE WRIGHT, Sonoma State Home.

Four hundred seventy-seven mentally deficient and borderline patients, examined with the Revised Stanford-Binet Scale, were rescored on the basis of the abbreviated scale. A difference as great as 5 IQ points occurred in one case in six, and a difference greater than 5 IQ points in one case in nine. Individual discrepancies ranged from 17 points too low to 13 points too high.

A modification of the procedure was found which gave a difference as great as 5 points for only one case in 34 and a difference greater than 5 points for only one case in 68. Individual discrepancies range from 7 points too low to 6 points too high. This modified procedure results in a twenty per cent saving in the number of items over the complete scale.

The Relation of Electrodermal Resistance to Performance in a Serial Learning Task. ERWIN A. ESPER and VIRGINIA FAIRFAX, University of Washington.

In a serial learning task it was found that electrodermal resistance, after an initial rise, continuously fell until the subject reached the criterion. The resistance of those subjects who required a large number of trials to reach the criterion therefore dropped to lower levels than did those of the faster learners. This finding is related to individual differences in performance at various stages of the learning.

An Evaluation of the Institutional Adjustment of the Psychopathic Offender. ROBERT B. VAN VORST, Preston School of Industry.

A comparative evaluation was made of twelve cases of so-called psy-

chopathic personality, committed to an institution for older delinquent boys. Each case of psychopathic personality was matched in regard to intelligence, race, age, and level of home background with about five other cases. Comparisons were made between the adjustment of each psychopathic case, and the adjustments of the matched cases, not adjudged psychopathic.

Findings indicate that the psychopathic offender is a more difficult problem to adjust within the institution than the ordinary delinquent, who may parallel him in personal traits and home background. The relevance of these findings to the practical diagnostic use of the term 'psychopathic personality' is considered.

Studies of Children's Reasoning. F. T. TYLER, University of British Columbia.

This study reports the results of the administration of certain types of reasoning tests to pupils in Grades 6-9. A modification of the Yerkes Multiple Choice apparatus was used in testing junior high school pupils. Concepts similar to those used by Smoke were administered to individuals and to groups (by means of film slides) at the Grade 6 level. Correlations with other psychological measures were computed.

An attempt was made to analyze the method of attack used by junior high school pupils. This suggested that these students sometimes used "negative" instances in rule induction. For this reason a more extensive study of the rôle of negative instances was made at the Grade 6 level. Some of the other problems studied include (1) sex differences, (2) types of errors in reasoning, and (3) the factors associated with the difficulty of the problems.

An Apparatus for Producing Variable Rates of Change in the Intensity of a Tone. GEORGE PLANT HORTON, University of Washington.

The purpose of this paper is to describe an apparatus which presents a tone whose intensity may be increased or decreased at different rates. The output of an oscillator is led through suitably selected resistances which control the voltage across a potentiometer driven by a synchronous motor. The output of the potentiometer is led to crystal headphones.

The subject is presented with a tone of 1000 cycles per second at 40 db. After three seconds this tone may or may not increase (or decrease) at a previously selected rate. Five seconds later the tone reaches a new intensity level remaining there three seconds and then is terminated. During the final period the subject is required to state whether or not the tone changed. Preliminary results on one subject will be given.

Further Investigation of "Eidetic Imagery." JOSEPH E. MORSH, University of British Columbia.

In reporting so-called "eidetic" phenomena, various investigators have evidently included certain data due to memory and imagination as well as after-images. Where a high incidence of "eidetic" imagery is mentioned, the investigator is apparently dealing with memory images, whereas low incidence may indicate after-images. In the present investi-

gation attempts to identify or classify "eidetic" images had to be abandoned. It seemed more fruitful for experimental purposes to consider after-images as forming a continuum with no demonstrable imagery at one extreme and vivid, persistent after-images at the other extreme. Of 256 subjects of both sexes, ranging in age from 10 to 19 years, approximately 30 per cent were unable to obtain after-images under the experimental conditions used. Thirty-four subjects reported after-images in complementary colors and 123 subjects obtained positive after-images. After-imagery showed a fair degree of correlation with art ability, a small correlation with spelling but virtually no correlation with English composition.

Friday Afternoon, June 26

SYMPOSIUM: SOME PSYCHOLOGICAL FACTORS
INVOLVED IN THE ESTABLISHMENT
OF PERMANENT PEACE

HOWARD R. TAYLOR, Chairman

From the Viewpoint of Education. HUBERT S. COFFEY, Ellensburg.
From the Viewpoint of Clinical Psychology. E. NEVITT SANFORD, California.
From the Viewpoint of Animal and General Psychology. EDWARD C. TOLMAN, California.

Saturday Morning, June 27

EDWARD C. TOLMAN, Chairman

Attributes of Enemy, Allied, and Domestic Nationality Groups as Seen by College Students of Different Regions. RALPH H. GUNDLACH, University of Washington.

Students at a number of universities were asked to fill out a blank which provided an opportunity to evaluate a dozen different nationality groups and sub-groups with regard to 10 different aspects or traits. Each such aspect was presented as a 7-point one-dimensional scale, such as "like-dislike" or "cruel-kindly," and the student simply checked the spot appropriate to his feeling.

Students distinguished between Japanese, and Japanese-Americans; between Nazi Germans and German Americans and German refugees, etc. Of our Allies, the Chinese are most favorably viewed, followed by the French, English and Russian. There are significant regional differences in student opinion.

Eye Movements and Shift of Retinal Image in Stereoscopic Depth Perception. STEVENSON SMITH, University of Washington.

The reported experiments demonstrate that the shifting of homologous stimulation from non-corresponding to corresponding retinal areas is not an essential factor in depth perception.

Gnats and Camels in Quantitative Research. D. WELTY LEFEVER, University of Southern California.

Recent emphasis on the exact sample theory developed by R. A. Fisher and his disciples has been accompanied in many instances by a tendency to express the results of quantitative research in terms of a degree of numerical precision unwarranted by the character of the facts involved. This paper does not debate the increased validity of the research procedure but questions seriously the meaningfulness of the accuracy implied by the statement of the results.

Several recently published illustrations of the above contention are analyzed and the degree of precision implied by the findings are examined in the light of criteria suggested. Random samples selected under controlled conditions are presented as a basis for suggesting logical limits of numerical accuracy. The examples of research chosen include a consideration of the accuracy of the mean, the standard deviation, the Pearson correlation coefficient, and the F-test for analysis of variance. The effects of errors of sampling, response, and validity are briefly considered in terms of their influence on the stated outcomes of research.

Effect of the War Emergency on Selective Elimination of Students at the University of Oregon. JEAN RIDDELL, University of Oregon. (Introduced by H. R. Taylor.)

Continuance with the University studies through the junior year was examined for two large unselected groups of sophomores. The control group completed the junior year before the outbreak of war; the experimental group are completing it under war conditions. Scores on the Ohio State Psychological Examination, Form 20, and first term University grade averages are compared for the two groups. In the control group selective elimination of those with low first term grades takes place, but, after the freshman year, there is no selective elimination of those with low college aptitude test scores. In the experimental group selective elimination of those with low first term grades takes place and significant elimination of those with low OCA scores, in the case of both men and women. Elimination on the basis of test score is most apparent in business administration, law, physical education and the social sciences.

Torsion in Persons with No Known Eye Defect. THOMAS G. HERMANS, University of Washington.

Since Listing and Donders the problem of torsional eye movements has shown a sporadic out-cropping in psychological literature. No norms for the direction or amount of torsion have been established, and current opinion is confused. In the present study norms are established for 104 male naval-science students testing 20-20 vision and having no known eye defect. The theoretical value of torsion for any combination of the two variables, as derived from the obtained means, is expressed by the equation,

$$Z = +.00573x^2 + .00001y^2 + .00148xy + .07029x + .0028y + .06876$$

in which Z is the torsion in degrees for each eye, x degrees of convergence, and y degrees of elevation above or below (plus or minus) horizontal.

Some Correlates of the Harding Morale Scale. SANFORD, R. N. and CONRAD, H. S., University of California.

Harding's Scale for Measuring Civilian Morale was administered to 270 college students—100 men and 170 women—on December 3, 1941. These students filled out, during the same hour, a lengthy questionnaire pertaining to numerous personal and social factors. The report discusses the reliability of the Morale Scale, and the relations of "morale score" to such variables as age, sex, national extraction, place of residence, religious denomination, College Major, favorite parent, parental harmony, introversion, and security feeling. (Dr. Edwin Ghiselli assisted in planning the research and in preparing the questionnaire.)

PROCEEDINGS OF THE ELEVENTH ANNUAL
MEETING OF THE ROCKY MOUNTAIN
BRANCH OF THE AMERICAN PSY-
CHOLOGICAL ASSOCIATION

THOMAS H. HOWELLS, EXECUTIVE SECRETARY,
UNIVERSITY OF COLORADO

The annual meeting of the Rocky Mountain Branch of the American Psychological Association was held on November 7 and 8, 1941, at the Colorado School of Mines, at Golden, Colorado. The following officers were elected: President, Robert H. Bruce, University of Wyoming; Executive Secretary, Thomas H. Howells, University of Colorado.

The following papers* were presented:

1. *The Psychological Field as a Determinant of the Behavior and Attitudes of Preschool Children.* LILLIAN PORTENIER, University of Wyoming.
2. *The Influence of College Life on Intelligence Tests Scores.* J. D. HEILMAN and NORA A. CONGDON, Colorado State College of Education.
3. *An Experimental Search for the Psychological Sources of the Phi Phenomenon.* ALBERT W. HEYER, University of Colorado.
4. *An Empirical Ranking of Written English Ability as Compared with Standardized Test Scores.* S. L. CRAWLEY, Colorado State College of Education.
5. *Some Presuppositions of Scientific Method.* PAUL CRISSMAN, University of Wyoming.
6. *The Effect of Metrazol Convulsions on Retention in the Rat.* L. I. O'KELLY, University of Colorado.
7. *Heart Beat as a Measure of Hyperthyroidism in the White Rat.* CECIL W. MANN, University of Denver.
8. *Food Ingestion as a Function of Thirst in the Rat.* JULIUS BOONSHAFT, University of Colorado.
9. *A Study of Post-college Success.* W. P. REED, University of Wyoming.
10. *Adult Occupational Adjustment.* ROBERT W. SHAW, State Capitol, Denver.
11. *The Social Psychology of Democracy.* T. H. HOWELLS, University of Colorado.
12. *The Rock River Hoax.* L. V. FEES, Fraser, Colorado.

* These papers were also included on the program of the Colorado-Wyoming Academy of Science, and abstracts are available in the journal of the Academy for 1942.



PSYCHOLOGY AND THE WAR

Edited by

STEUART HENDERSON BRITT

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FIRST REPORT OF THE SUBCOMMITTEE ON SURVEY AND PLANNING FOR PSYCHOLOGY*

BY EDWIN G. BORING, ALICE I. BRYAN, EDGAR A. DOLL,
RICHARD M. ELLIOTT, ERNEST R. HILGARD, CALVIN
P. STONE, ROBERT M. YERKES (Chairman)

Consequent to the "proposal for a preliminary conference by psychologists to consider a comprehensive program for coördinating psychological service for the national welfare," which was transmitted to the Emergency Committee by Edgar A. Doll in the spring of 1941, to subsequent discussions, and to a special report and recommendation on the subject by Robert M. Yerkes in May, 1942, it was voted "that the Emergency Committee regards long-range planning for the advancement of the profession as one of its fundamental problems, and designates Dr. Yerkes and a group of five or six psychologists to be selected by him as a group to prepare a report on long-range as well as emergency problems to be submitted to the Emergency Committee at a special session."

Under this mandate, Edwin G. Boring, Alice I. Bryan, Edgar A. Doll, Richard M. Elliott, Ernest R. Hilgard, Calvin P. Stone, and Robert M. Yerkes promptly were constituted a Committee on Survey and Planning. Upon the invitation of the administration of The Training School at Vineland, New Jersey, the group met in that institution June 14 and continued in session until the evening of June 20. The expenses of the conference were generously met by The Training School, for which Edgar A. Doll served as host and representative on the Committee. It is noteworthy that just twenty-five years ago the Vineland institution, under its present guiding genius, Dr. Edward R. Johnstone, provided both setting and financial support for the committee which prepared the initial group intelligence tests for use in the United States Army.

Two years ago it might have been thought wise by this Committee to draw up a comprehensive plan for a psychological general staff or board of strategy; a national center, to consist of headquarters and a laboratory; and a training school for military and other psychological specialists needed in a war emergency. Such a direct attack on the situation no longer is practicable, since,

* This is the first report of the Subcommittee on Survey and Planning presented on July 25, 1942, to the Emergency Committee in Psychology, National Research Council. A supplement "Psychology as Science and Profession" is to appear in the November *Bulletin*.

independently or with the assistance of various psychologists, several special services already have been developed within the government to deal with problems of personnel appraisal, classification, training, and placement; with problems of psychological warfare; and with various phases of the handling of information, the measurement of public opinion, morale, propaganda, and the utilization of manpower. There now exist a multiplicity of useful psychological service agencies, which, although they may be coordinated for increase of efficiency, cannot readily be unified.

For these reasons the Committee defined its immediate task as (1) a survey and recommendation relative to the actual and potential rôle of psychotechnology in the war emergency, and (2) the formulation of a pattern for the development of psychology as science and service after the war.

This report of the findings, opinions, and suggestions of the Committee falls naturally into three parts:

- I. Psychology in the war emergency.
- II. Psychology in the postwar world.
- III. Special recommendations relative to Committee status and activities.*

Nothing in this report may be interpreted as criticism of any particular individual or service group. The Committee realizes that in so vast a mechanism our best individual intentions and efforts may be frustrated and that democracy now penalizes and again rewards its honest and wise servants. This statement is an attempt to take an impersonal over-all view of psychological services in the war.

I. PSYCHOLOGY IN THE WAR EMERGENCY

Assisted by Steuart Henderson Britt, Executive Director of the Office of Psychological Personnel, Washington, D. C., the Committee at the outset made a comprehensive survey of the current areas of psychological service in the nation. The review was impressive in its variety and magnitude, for already much more has been achieved by way of opportunity for usefulness, recognition of the profession, and technical contributions than in any previous period of national emergency. It seems probable that the present conflict will do for social psychology, in the broadest sense of that term, what the first World War did for intelligence testing. There

* Section III was not released.

is abundant ground for satisfaction, encouragement, and gratitude to those who are carrying the responsibilities of leadership and organization and who are safeguarding present advances.

Naturally the survey revealed weaknesses and neglected opportunities. How could it be otherwise in such a vast, complicated, and precipitate effort? Independent special services which involve psychology are under the necessity of demonstrating to the utmost their immediate practical value. They tend, therefore, to be competitive instead of optimally coöperative. The greater the multiplicity of such services, the greater the risk of undesirable duplication and oversights. Methods widely useful tend to be ignored or limited in their application to the service which happened to develop or adapt them. Often such neglects of adequate techniques are due to ignorance of their availability and suitability. To cite specific instances here would be invidious and unfair. New needs, of course, are constantly developing from our military experience and our lessons in dealing with manpower. Self-examination, self-criticism, and official inspection are essential, and undoubtedly they are being practiced to good effect. Nevertheless, and even at the present juncture, the Committee believes that a planning board, consisting of a few individuals unattached to any special service, would be useful in discovering duplication of effort, failure of coöperation, and those emerging opportunities and needs which no single service is likely to note or to be able to meet.

Apparent also is the inadequacy of provision for the training of psychological specialists to prepare them to meet military and other needs of the emergency. Additional schools of military psychology are urgently needed in both the Army and the Navy. The facilities of educational and other suitable training institutions should also be employed for this purpose immediately and effectively. Psychologists in administrative and educational positions as well as those in the federal services should give attention to this deficiency in our preparedness, for should the war stretch into years the shortage of psychologically trained persons for the military and educational needs of the nation will become acute.

Failure to concentrate both early and late on the problems of leadership has been a particularly grave military and civilian oversight. This Committee has discovered no adequate provision or plan for systematic and thoroughgoing attack on this extremely important group of practical problems. Adequate methods have not been developed to further the discovery, training, and utiliza-

tion of capacities for leadership. So far as is now possible, this gap should be filled by the prompt organization of a group of specialists to devise and develop methods under imaginatively constructive leadership. Such an undertaking, if properly supported by the government, might very well prove its most profitable investment in the field of mental engineering.

So far it does not appear that psychological techniques and experience have been made conveniently available to the war industries. There exists no central national agency or service of psychological advice and recommendation. This neglect is also costly, for much might readily be done to supplement the work of the industrial personnel specialists and of existing federal organizations, and to increase and safeguard the production of matériel of warfare. It is the earnest hope of this Committee that persistent attention may be given to civilian needs for psychological service, and especially to those which are rapidly developing in the special war industries, in agriculture, in education, and in varied social agencies.

It is not surprising to find that the representation of psychology in key positions, where opportunity appears for usefulness in planning and in organization, is both incommensurate with our professional resources and inadequate to the current opportunities and needs. Obviously it is desirable to direct attention to these problems of placement. It is good strategy to have the right man in the right place, even though the position be of minor importance, but it is incomparably more important that psychotechnology should be strongly represented on planning boards, so that whatever contributions the profession may have to offer shall be made known and considered early instead of late. Thus far psychology has failed to take its proper rôle in the planning councils of the nation. Appropriate and sufficient effort has not been made at the right time and in the right places.

It is highly desirable, in the opinion of the Committee, that the resources of the Division of Anthropology and Psychology of the National Research Council be more generally and effectively used for and by the several federal services in which psychological techniques are being employed for the solution of problems of mental engineering. In particular it is recommended that support of the Office of Psychological Personnel be increased and its potentialities of usefulness further developed. This Office consti-

tutes our primary provision for self-help and guidance in the discovery of opportunities for professional usefulness.

The conference method is proposed as a practical means of bringing together psychological representatives of those federal services which have common problems and of affording them opportunity for profitable discussion, the legitimate exchange of information, and the improvement of coördination and coöperation among themselves and with non-governmental agencies. Whereas no federal service group ordinarily can undertake this sort of venture, the National Research Council is in a peculiarly favorable position to do so, and among its chief functions should appear such efforts to facilitate interservice contacts, the exchange of information, and the joint solution of problems of coördination.

The Committee does not presume to make at this time other than these general suggestions and recommendations concerning psychological services in the war emergency. In the interests of clarity, they are recapitulated below:

1. There should be established a general planning board to promote the applications of psychology in the war emergency.
2. Professional training schools for psychologists should be established in connection with the armed services, in the universities, and in other civilian institutions which are prepared to train specialists.
3. Further and special provision should be made for the study of leadership and the training of leaders.
4. There should be a centralized service of psychological information and counsel for the war industries.
5. Representation of psychology should be secured on the central planning councils of the nation.
6. The Office of Psychological Personnel should be given additional support, financially and through assistance and consultation.
7. The Division of Anthropology and Psychology, National Research Council, should be enjoined to arrange as practicable for conferences between psychological specialists in the armed services and in other governmental agencies.

II. PSYCHOLOGY IN THE POSTWAR WORLD

Psychology as the science of behavior and experience and as major basis for mental engineering undoubtedly will play an increasingly important rôle in human affairs. Its representatives now have a unique opportunity and responsibility to prepare plans to promote and safeguard its development. In the new world order its knowledge and skills should be professionalized steadily and

wisely so that its applications may keep pace with emerging human needs and demands for personal and social guidance. Foremost among the conditions necessary for the sound and socially profitable maturation of the science and of its technology are: unity of spirit and action; optimal provision for the effective training of psychologists as teachers, practitioners, and investigators; and the creation of such occupational specialties within applied psychology as will satisfy individual and group demands for help in living.

In accordance with this analysis, the Committee addressed itself in turn to each of these three questions:

A. How can a profession be wrought out of diverse elements as they exist at present and made to achieve unity of aspiration and endeavor?

B. How can psychologists best be trained as competent, trustworthy scientists, practitioners, or both, and enabled to coöperate with mutual understanding, respect, and appreciation, despite their diversity of interests?

C. How can social services of mental engineering be designed, directed, and developed so that they may be helpful and also equally available to all who may require them?

Question A: How unify psychology?

It is the conviction of the Committee that the development of psychology as science and practice should proceed in close relation; and that the scientists of the profession should welcome technological developments and generously aid and encourage them. In order to unify the profession it is proposed by the Committee that a suitably located national center be established as general headquarters, to house an organization which shall serve alike the interests of all national psychological societies and their members. Such a center might be designated and incorporated as an American institute of psychology. National societies might appropriately constitute its supporting and governing membership. Thus in a single service agency, created and conducted to promote the progress of psychology, it should be possible to unite all interests for the benefit of all psychologists, irrespective of their professional affiliation or specialization. Such a plan should tend to counteract any tendency of 'scientists' of the profession to hold aloof from 'applicationists,' or conversely; and to prevent or minimize the unnecessary multiplication of special organizations and the appearance of undesirable types of commercially motivated society.

Through its director, a governing board composed of representatives of the constituent societies, and a secretariat, such a national institute, if strongly supported, should be able to serve the profession much more satisfactorily than can existing organizations. Typical of its functions would be the handling of personnel information, employment data, public relations, publicity, the publication of professional journals, and the promotion of projects designed to advance psychology and to obtain recognition and service opportunities for psychologists. The constituent societies would of course continue as autonomous bodies, owning and controlling journals and other property, if they chose, maintaining their own standards of membership and type of organization. The institute, however, would assist their officers in a wide variety of functions, and in particular relieve them by serving as central business office, and bureau for varied and desirable professional services which at present are not available.

In supplementation of this proposal, the Committee has agreed to prepare a design for an American institute of psychology. Fortunately there exist well established precedents among the sciences and their branches of engineering which will serve in varied respects as models.

Further, the Committee suggests that plans be considered for a convention of duly appointed delegates from the several national societies to discuss and act on this proposal for an American institute. If the delegates could be selected in September of the current year and a plan presented to the societies in September, 1943, it should be possible, in case of general approval, to put it into effect by January, 1944. Otherwise, an additional year would be required for deliberation.

Pending consideration of the above proposal, and to enhance the immediate usefulness of psychology in the emergency while efforts are being made to prepare for desirable postwar developments, it is strongly recommended that the present Office of Psychological Personnel in Washington be used as national headquarters and that all members of the profession be encouraged to take advantage of its national and advisory services. It is especially desirable that psychologists generally familiarize themselves with the organization and resources of the Office, consult with its personnel as they have need, and support the undertaking by joining one or more of the psychological societies.

Question B: How prepare psychologists?

To the question, How best prepare psychologists for professional effectiveness? there is no single answer. The Committee, however, has agreed on certain principles of organization and action which it considers important.

Of the several types of educational institution and program which now are utilized for the professional training of psychologists, no one is clearly superior to all others. The well organized, strongly staffed graduate school has its advantages, but so also does the well planned professional school; and, in contrast with these, the combination of collegiate, graduate school, and field work opportunities for self-development commends itself to some as best of all. It is the consensus of the Committee's opinion that our profession should not adopt any one of the types of professional school represented by medicine, law, engineering, or social work. Instead, it is believed that a new type of organization for the training of psychologists should be evolved in which the desirable educational facilities of college, graduate organization, and internship are successfully integrated.

As principles of operation which would assure satisfactory ability and training, the Committee proposes the following:

Recruitment of suitable college students should be provided by orientation courses and other opportunities to learn about what psychology is and what psychologists do.

Selection by rejection or elimination is necessary to assure both ability and preparedness to profit by professional training, but so far as practicable elimination should be subordinated to directive instruction and good counsel.

Guidance, initially and throughout the long period of training for professional work, is indispensable. Special emphasis should be placed on the personality adjustment and professional growth of the student. Many individuals should be reoriented and directed into new and more suitable channels of educational and vocational effort.

Pre-professional training should include discipline in areas of the physical, biological, and social sciences, and in mathematics and its applications. However desirable it may be that a student should have some familiarity with the humanities, he cannot be considered properly prepared for advanced work in psychology until he is thoroughly grounded in the methodologies and principles of the sciences.

No single program of instruction, no curriculum, can be recommended as best for professional training in psychology. The way in which a discipline is used instructionally usually proves to be more important than its subject matter. And whatever the combination of experimental, historical, and other instructional courses elected by a student, he should also engage in some field work, or practical application of his field of knowledge, to acquaint him early in his professional studies with psychology at work and with relations of its facts and principles to vital problems.

Adequately supervised and criticized service as interne, either within the educational institution for the prospective teacher of psychology, or in school, clinic, hospital, factory, civic, state, or federal agency for those who plan to devote themselves to psychological practice, must in any event be considered indispensable. Ordinarily a full year or its distributed equivalent should be spent thus. Only exceptionally should the internship requirement, or the preparation of a thesis based upon original work, be waived.

Interdisciplinary relations are of the utmost importance, since defining boundaries are imaginary and it is known that we work most effectively, even as students, when we disregard departmental lines and follow our intellectual objectives through to the solution of a problem or the satisfaction of our curiosity. Moreover, for the training of psychologists no single subject is sufficient. Large areas of biological science, the methodologies of the physical sciences, some among the social sciences, and many of the procedures of mathematics should be considered essential. The really excellent representative of our science and its technologies inevitably is more than a psychologist. Wisdom dictates that as psychologists we should not concentrate exclusively on the development of techniques for our own use and for export to other disciplines, but should constantly seek opportunity to bring into the service of our own science the discoveries, methods, and modes of thinking of our fellow scientists.

Neither length of course nor the particular educational route followed is important. One student may profit more by three years of professional work than another does by six, and the route which proves most profitable for the one may be ill-suited to the needs or capacities of the other. Even the degree finally awarded for achievement of proficiency has significance only as it indicates the field of individual competence. Hence this Committee is of the opinion that the doctorate of philosophy should eventually be

replaced for the sciences by the doctorate of chemistry, zoology, sociology, or psychology, as the case may be.

Certification and licensure are essential requirements for the protection of practitioner and public, but it is thought by the Committee that attention should at present be focused rather on procedures and standards of instruction and on the educational products of the institutions which undertake to convert students into professional psychologists than on the immediate achievement of satisfactory legal protection. Educational institutions should be accredited or rated in accordance with their organization and its fruits. The annual certification of individuals who would practice their profession is preferable to certification for an indefinite period. Although the Committee does not advocate change in existing practices until the profession is more satisfactorily established and plans matured and generally agreed upon, it is believed that, for the present, improvement of the procedure for certification will best serve the interests of the profession and the public.

Question C: How create psychological services?

How best promote and guard the development of psychology as an instrument of social progress? This proved to be the most difficult of the questions for which the Committee sought reply, but agreement finally was reached on several relevant matters of professional policy.

(a) To define or delimit the actual and prospective categories of psychological service seems unprofitable. Rather, human needs should be studied in their emergence, and effort made continuously to develop those varieties of mental engineering which prove useful to the individual and to society. Certain terms have come into use to designate methods and areas of specialization. Thus psychotechnologists are now referred to as clinical, educational, industrial, social, from the standpoint either of procedures or of the areas of their employment. No single principle of classification is apparent, and on the whole it seems wiser that natural development rather than a logical scheme should determine the grouping of varieties of service. The evolution of medical specialties provides us with such a natural pattern. Presumably psychology's path will become established satisfactorily if we but observe and classify the problems of human behavior and experience as they present themselves for practical solution and are met by practitioners.

(b) Psychological services cannot develop profitably in isolation, for no area of knowledge and no type of application is sufficient to itself. Mental engineering, as inclusive of all psychological services, is itself a branch of human engineering. Hence psychologists, whether as scientists or as technologists, should work in intimate coöperation with their fellows in other fields of inquiry and practice. Whether they should function as principals or as subordinates should be determined by the nature of the task, not by the accident of professional prestige. Steadily the psychologist should extend and supplement the social services for which heretofore educators, physicians, priests, social workers have been mainly reponsible.

(c) Finally, it is the judgment of the Committee that psychological practice should face a future in which it will serve best by becoming organized as public service, not exclusively as private practice deriving its support from fees. If psychology follows this course, the profession will be able to further the movement already in progress for the socialization of welfare services and to hasten the adaptation of existing callings to actual human needs. Professionalization and socialization, given wisdom and foresight in our planning for psychology, may proceed together. Existing institutions, such as nurseries, schools, public employment offices, clinics, welfare agencies, and hospitals, already offer varied opportunities for the practicing psychologist. They, as well as institutions of training, should hold themselves in a measure responsible for the professional competence and dependability of their specialists.

The Committee's recommendations for the more permanent development of American psychology may be recapitulated as follows:

1. There should be established a central American institute of psychology to provide professional services of personnel, placement, public relations, publicity, and publication.

2. Until such an institute is established, psychologists should be enjoined to utilize more fully and to support more adequately the present Office of Psychological Personnel in Washington.

3. The formation of an institute should be approached by the calling of a convention of the potential member societies to consider plans and to initiate appropriate action within the societies.

4. The professionalization of psychology should be promoted by the advancement and improvement of professional training, with full regard to the recruitment of students for such training, their selection, their subsequent personal and vocational guidance.

their preliminary and professional education, and their use of internships for practical experience—all with due regard to the adjustment of formal specifications to the requirements of the particular case.

5. A satisfactory procedure of certification should be developed for general use. Licensure by state or nation should await further development of the profession and concerted action, with the support of an educated public opinion.

6. It is premature to attempt classification of applied psychologists, as for example, clinical, educational, industrial, social.

7. The boundaries of psychology should not be rigidly fixed by its professionalization, and the individual should be encouraged to deviate from formal training in order to meet specific social needs.

8. The socialization of psychology as profession is preferable to its development generally or exclusively as private practice.

PSYCHOLOGISTS IN GOVERNMENT SERVICE

DAEL WOLFLE

Emergency Committee, National Research Council

In the June, 1942, issue of this journal I published the names of psychologists in the service of the United States government who had submitted information in compliance with a request mailed with the current issue of the A.P.A. Yearbook. Until August 9, 1942, 70 additional questionnaires were returned by the following people. Those names marked with an asterisk are in part-time, and those without an asterisk in full-time federal service.

ALLGAIER, EARL, War Dept., Washington, D. C., Associate Personnel Technician.
ASHCRAFT, KENNETH B., Personnel Procedures Section, A.G.O., Washington, D. C., Personnel Technician.

BAKER, LYNN E., Division Stat. Research, U.S. Census Bureau, Washington, D. C. Associate Psychologist.

*BENNETT, GEORGE K., Psychological Corp., New York City, Special Consultant to the Secretary of War.

BILLIG, ALBERT L., 1328 Gordon St., Allentown, Pa., Psychological Examiner at Recruiting and Induction Station.

BLAKEY, ENSIGN ROBERT I., USNR.

*BOLGAR, HEDDA, 5519 Blackstone Ave., Chicago, Specialist, Psychological Warfare Branch, War Department, Washington, D. C.

BORING, 2ND LT. FRANK H., Army Air Corps.

*BRIDGES, KATHERINE M. B., Education Dept., Newarke St., Leicester, England, Consultant psychologist for evacuee children.

BRUCE, LT. ROBERT H., H-V(S), USNR.

*BRYAN, ALICE I., School of Library Service, Columbia University, New York City, Collaborator, U. S. Forest Service; Member, Subcommittee on Services of Women Psychologists, N.R.C.; Member, Subcommittee for Survey and Planning in Psychology, N.R.C.

CLARK, KENNETH E., Classification Division, Army Air Forces, Asst. Personnel Technician.

*DREESE, MITCHELL, George Washington University, Washington, D. C., Consultant, National Roster Scientific and Specialized Personnel.

DUNLAP, JACK W., University of Rochester, Rochester, New York, Director of Research, Committee on Selection and Training of Aircraft Pilots, N.R.C.

FIELDS, VICTOR, Norfolk Navy Yard, Portsmouth, Va., Special Representative, U. S. Civil Service Comm.

FISKE, ENSIGN DONALD W., H-V(S), USNR.

FISHER, LT. (JG) M. BRUCE, H-V(S), USNR.

*FLEMING, VIRGINIA VAN DYNE, 500 N. Garfield St., Arlington, Va., Participant-observer for N.R.C.

*FRANZEN, RAYMOND, 9 Rockefeller Plaza, New York City, Consultant, Civil Aeronautics Administration; Consultant, Intelligence Division, Office of Facts and Figures.

FROST, ENSIGN CARL F., H-V(S), USNR.

*GAW, ESTHER ALLEN, Pomerene Hall, Ohio State University, Columbus, Ohio, Member Board of Fifth Service Command for selection of Women's Army Auxiliary Corps officers.

GIESE, WILLIAM JAMES, Itasca, Illinois, Research, N.D.R.C.

GOODMAN, CHARLES H., 2146 N. 2nd St., Harrisburg, Pa., Chief Examiner, Employment Board.

HARRIS, LT. (JG) DANIEL H., USNR.

HAWKINS, HERMIONE HUNT, Classification Division, Office of the Secretary of War, Senior Investigator.

HOBBS, 1ST LT. ROBERT N., Army Air Corps.

HOPKINS, LT. (JG) E. H., D-V(S), USNR.

HUDSON, BRADFORD B., Lock Drawer 6, Fort Monroe, Va., Research, N.D.R.C.

JENKINS, LT. COMDR. JOHN G., A-V(S), U.S.N.R.

JENSEN, CAPTAIN MILTON B., The Armored Force, Army of the United States.

*JURGENSEN, CLIFFORD E., Kimberly-Clark Corp., Neenah, Wisconsin, Instructor, ESMWT classes in industrial psychology.

KAPLON, LT. (JG) MARTIN D., H-V(S), USNR.

*KELLEY, TRUMAN L., 90 Follen Rd., Lexington, Mass., Expert Consultant to the Secretary of War.

KNOX, LT. (JG) GEORGE W., D-V(P), USNR.

KORNREICH, CPL. JEROME S., Army Air Corps.

LEVIN, 1ST LT. BERNARD M., Adjutant General's Department, Army of the United States.

LOUTTIT, LT. COMDR. C. M., USNR.

McILVAINE, PVT. FRANKLIN M., Adjutant General's Department, Army of the United States.

METFESSEL, CAPT. MILTON, Army Air Corps.

MEYER, PVT. HERBERT I., Army of the United States.

*MILES, WALTER R., 333 Cedar Street, New Haven, Connecticut, Emergency Committee in Psychology, N.R.C.; several other N.R.C. Committees.

*MURPHY, GARDNER, C.C.N.Y., New York City, Counsellor, Bureau of Agricultural Economics, Department of Agriculture.

NEFF, WILLIAM D., Box 281, Noank, Conn., Research, N.D.R.C.

*NEWLAND, T. ERNEST, Dept. Public Instruction, Harrisburg, Pa., Examining inductees.

RICHARDS, LT. T. W., H-V(S), USNR.

SEARS, RICHARD, National Training School for Boys, Washington, D. C., Associate Psychologist, U. S. Public Health Service.

SCHNELLE, 1ST LT. KENNETH E., Army of the United States.

SCHRADER, WILLIAM B., Personnel Procedures Section, A.G.O., War Dept., Washington, D. C., Assistant Personnel Technician.

SHELDON, MAJ. W. H., Army Air Corps.

SIMMONS, CAPT. SIDNEY M., Army of the United States.

SOLLENBERGER, 1ST LT. RICHARD H., Army Air Corps.

STROMBERG, LT. (JG) ELEROY L., H-V(S), USNR.

SWIFT, PFC. FREDERICK W., Army Air Corps.

TENNIES, 1ST LT. L. GRANT, Sanitary Corps.

- *THOMPSON, ALBERT S., Dept. Psychol., Univ. of Penna., Phila., Pa., Research,
N.R.C. Committee on Selection and Training of Aircraft Pilots.
- THOMPSON, HELEN REED, Civil Service Commission, Main Bldg., Washington,
D. C., Associate Examiner and Negotiations Officer.
- TOLMAN, RUTH S., Division of Program Surveys, B.A.E., U. S. Dept. of Agricul-
ture, Washington, D. C., Associate Psychologist.
- TROLL, LILLIAN ELLMAN, Personnel Procedures Section, A.G.O., War Depart-
ment, Washington, D. C., Jr. Personnel Technician.
- VALLANCE, PFC. THEODORE R., Army Air Corps.
- VOSS, J. ELLIS, 6225 Morton St., Philadelphia, Pa., Civilian Training Supervisor,
Phila., Signal Depot.
- WARD, CAPT. LEWIS B., Army Air Corps.
- WATSON, LT. (JG) ROBERT I., H-V(S), USNR.
- *WECHSLER, DAVID, Bellevue Psychiatric Hospital, New York City, Special Con-
sultant to the Secretary of War; Consultant, Personnel Procedures Section,
A. G. O., War Department, Washington, D. C.
- WEGROCKI, LT. HENRY J., Medical Corps.
- WHITTEMORE, MAJ. IRVING C., Army of the United States.
- WICKERT, CAPT. FREDERICK, Army Air Corps.
- WILCOX, WARREN W., 1511 W. Broadway Drive, Portland, Oregon, Junior Em-
ployment Officer, U. S. Employment Service.
- WILLIAMS, CHIEF PETTY OFFICER ROGER KENTON, U.S.C.G.
- WISCHNER, CPL. GEORGE J., Army Air Corps.
- WITMER, LOUISE R., Personnel Procedures Section, A. G. O., War Department,
Washington, D. C., Head, Test Construction.

THE SELECTION OF CANDIDATES FOR THE OFFICER CANDIDATE SCHOOL AT THE WOMEN'S ARMY AUXILIARY CORPS TRAINING CENTER

FLORENCE L. GOODENOUGH

University of Minnesota

That the success of the women's army as an aid to the war effort will depend to a large extent upon the quality of its leaders is self-evident. Fortunately its director, Mrs. Oveta Culp Hobby, was sufficiently far-seeing to recognize this fact and to arrange for the selection of candidates for the First Officer's Training Camp in such a way that neither outside influence nor political expediency could influence the choice. As far as was humanly possible, merit only was considered. Since human judgment is fallible, the selections may not always have been wise, but they were at least made by a group of persons who may properly be classed as experts in their various fields and who were free to make their choices as they saw fit.

The procedure was as follows. In accordance with the instructions given in a nation-wide publicity campaign, women who desired to enroll for training as officers went first to the local recruiting stations. There they were given the necessary application blanks and a folder in which the basic information about requirements for admission, rates of pay, duties, furloughs and the like was given in question and answer form. Completed applications together with proof of citizenship, date of birth, graduation from high school and a health certificate were sent to the main local recruiting office where they were examined and all that failed to meet formal requirements were rejected. Qualifying candidates were then notified of the time and place to take the mental alertness test which was similar to that used in the regular army. Those passing were then interviewed by a local board which consisted of the main recruiting officer and two women assistants selected by him. Officers were instructed to choose women from the personnel divisions of business or social service organizations wherever possible. If no women who were experienced in interviewing were available, those who had taken an active part in directing the work of such organizations as the YWCA, the Community Chest Council or the Red Cross were chosen.

Local interviewers were instructed to consider first of all the candidate's proved or potential ability as a leader of other women.

Leadership, it was pointed out, is an intangible, but certain general criteria to be used as a partial guide were indicated. Immediately after each interview a short rating scale was filled out on the basis of the joint opinion of the members of the board. Ratings were given on such matters as general appearance and bearing, speed of comprehension, poise, clearness and ease of verbal expression and the like. The report was concluded with an over-all judgment of the candidate's potentialities as an officer together with whatever notes or comments were deemed pertinent.

Physical examinations were given to the 500 candidates in each of the nine Army Corps Areas who, on the basis of the judgment of the local boards and the data given in the application blanks seemed to be the most promising. The procedure for selecting the 500 for physical examination differed somewhat from one Corps Area to another. In all cases, the records of all accepted candidates were sent directly to Corps Area Headquarters and a selection made by the Corps Area Boards who conducted the final interviews.

The Corps Area Boards consisted in each case of an officer from the main Corps Area recruiting office, a woman assistant appointed by him according to instructions similar to those given to the officers in charge of the local boards, and a representative appointed by the Director of the W.A.A.C. Two boards were chosen for each Corps Area. Of the 18 women appointed by the Director, 7 were psychologists.* In the selection of these persons assistance was given by Dr. Steuart Henderson Britt, Executive Director of the Office of Psychological Personnel, National Research Council, Washington, D. C. The others were, for the most part, college deans of women or heads of important social service agencies.

From the 500 who were given physical examinations, approximately 240 of the most promising were selected by the Corps Area Boards in each of the nine areas to be called to Headquarters for a final interview. These interviews occupied from twenty minutes

* Florence L. Goodenough, Professor of Child Welfare, University of Minnesota; Jean W. Macfarlane, Professor of Psychology, University of California; Grace E. Munson, Director, Bureau of Child Study, University of Chicago; Helen Peak, Professor of Psychology, Randolph-Macon Woman's College, Lynchburg, Virginia; Millicent Pond, Director, Psychological Test Research, Scovill Manufacturing Company, Waterbury, Connecticut; Agnes Arminda Sharp, Clinical Psychologist, Chicago; and Ruth S. Tolman, Bureau of Agricultural Economics, Department of Agriculture, Washington, D. C.

to half an hour in each case. Although more time would have been desirable had the schedule permitted, the data provided in the application blank together with the reports of the local boards eliminated the need for many of the questions usually asked and in most cases furnished advance information that indicated the general course which the interview should take. As was to be expected after so rigorous a sorting, the surviving candidates were, for the most part, a highly superior type.

At a preliminary conference held in Washington which was attended by all of the 18 women selected by the Director, the general plan for conducting the final interviews had been discussed. These interviews were somewhat less formalized than those conducted by the local boards since they were designed primarily to elicit clues as to the personality characteristics, attitudes and general adjustment of the candidates. At the close of each interview, a record form was filled out by the members of the board acting as a group. In conformity with the nature of the interview, these records were less formalized than those made by the local boards. More space was provided for individual comment and proportionately less emphasis was placed upon defined ratings.

After all the interviews had been completed, each board held a meeting in order to make a final classification of the candidates. Each set of records was reviewed in some detail. On the basis of majority opinion, the candidates were then ranked in approximate order of merit. In general, a high degree of uniformity of opinion among the board members was reported.

Many candidates of outstanding potentialities were rejected because they either had someone dependent upon them, or would have left their children. The policy was established that no one who had anyone dependent upon her pay as a member of the Women's Army Auxiliary Corps should be enrolled, and also that no one would be taken whose absence would deprive a child of parental care which it was accustomed to receiving. For these reasons many otherwise excellent candidates had to be rejected.

The same disposition was made of the applications of a number of "specialists," persons of outstanding ability in some particular line of work who were performing much needed service to their profession, and who, it was felt, were contributing more to their country in their present capacities than they would as officers in the W.A.A.C.

The 18 representatives of the Director then went directly to

Washington, taking with them the records of the 160 cases from each Corps Area (80 from each of the two boards) who made up the upper two-thirds of the groups interviewed. A three-day conference was held at W.A.A.C. Headquarters during which the records were again reviewed in collaboration with a specially appointed group of psychiatrists. Each case was then given a final rating. Four hundred and forty women were chosen to go to the opening session of the W.A.A.C. Officer Candidate School at Ft. Des Moines, Iowa. Others were accepted for training as officers but their admittance to the camp had to be deferred until a later date because of limited facilities. Those who were rejected as officer material were given the privilege of enlisting as auxiliaries. Since all future candidates for officer's training will be chosen from the ranks, those who were not selected at this time will still have an opportunity to earn an appointment later on if they enlist as auxiliaries. It is noteworthy that an overwhelming majority of them have already signified their intention to do so.

CONTRIBUTIONS OF THE PSYCHOLOGICAL CORPORATION TO THE WAR EFFORT

BY PAUL S. ACHILLES

Vice-President and General Manager, Psychological Corporation

Contributions of The Psychological Corporation to the war effort consist both in the services it renders *as an organization* and those which are rendered by various members of its staff *as individuals*, either wholly or partially apart from their connection with the Corporation. In many cases opportunities for service as individuals arise from this connection, and are furthered by the facilities of the Corporation or by the training and experience previously acquired by the individual in working with the Corporation. Mention of such services by staff members as individuals will be made first. The services and connections of those officers and directors of the Corporation who are not staff members are not included here other than to note the fact that President Walter R. Miles recently returned from a liaison mission to England.

Services as Individuals

Dr. Wallace H. Wulfeck was given full leave of absence from the staff from March 1, 1941, to April 1, 1942. During this period he served as Research Associate on a National Defense Research Committee project for the study of personnel problems related to fire control. Since April 1, 1942, he has continued work on this project on a part-time basis.

Dr. George K. Bennett is serving part-time as a member of the National Research Council Committee on Service Personnel, and of the Committee on Neurotic Inventory. He also served as Consultant to the Secretary of War, and is in charge of the preparation of special materials for both the Army and the Navy under contracts between them and The Psychological Corporation.

Dr. Henry C. Link is serving as Consultant to the State Administration of the Defense Savings Staff on problems connected with surveys of War Bond Pledges.

Dr. Arthur W. Kornhauser, of the Corporation's Chicago office, and Drs. Albert D. Freiberg, George K. Bennett, Margaret B. Erb, Wallace H. Wulfeck, and Mr. Richard A. Fear of the New York office are all devoting outside time to lecturing on personnel procedures, testing, etc., in the E.S.M. War Training Program. Dr. Kornhauser is also serving as Consultant and doing research

on civilian morale problems and public opinion for Chicago Civilian Defense. He is chairman of the Subcommittee on Opinion Studies.

Dr. Sidney Roslow, formerly assisting in the Corporation's Marketing, Industrial, and Test Divisions, is now doing survey work in connection with Dr. Rensis Likert of the U. S. Department of Agriculture.

Mr. Dean Manheimer, M.A., statistician and analyst in the Marketing Division, left the Corporation in January, 1942, to accept a position in the Special Services Branch of the War Department, where he is making contributions toward the study of morale through application of methods and techniques developed in the Corporation's commercial work. Miss Rita O'Neill, another former assistant in the Corporation's main office, is now also engaged in work in the War Department.

Miss Edith Margaret Potts, R.N., M.A., Director of the Testing Service Division for Schools of Nursing, is at the request of the National Nursing Council for War Service making a special study of eliminations from schools of nursing and their causes over a five-year period.

Miss Phoebe Gordon, M.A., Associate Director of the Testing Service Division for Schools of Nursing, is serving on a committee called by the National Nursing Council for War Service to assist in preparing a national pamphlet for recruitment of nurses.

Miss Elizabeth M. Kemble, R.N., Assistant Director of the Testing Service Division for Schools of Nursing, conducted a Red Cross First Aid Course in the Corporation's New York Office, from which some twenty-five members of the staff and office force obtained their qualifying certificates.

In July, Mr. Allan Johnson and Mr. Wayne Bates, both of whom had done advanced work in psychology and were serving as internes in the Corporation's Industrial Division, were given permanent positions in the personnel department of an airplane manufacturing company for which the Industrial Division is serving as consultant.

Four employees of the New York Office are now in military service: Henry C. Lutz, Joseph Reynolds, James MacDonald, and John Van den Broeck.

Services as an Organization

The activities of the Corporation as *an organization* also con-

tribute in that the services of each of its five nominally separate Divisions are valuable, directly or indirectly, to the war effort.

Test Division. The staff of this Division is now engaged in the development, production, and distribution of many tests and materials for military, industrial, educational, and other uses. The importance of these materials merits careful consideration in priority ratings, since proper equipment is essential to the work of psychologists, both in the armed forces and in war production industries. An instance in point is a contract to construct, produce, and supply in quantity three alternate forms of one of the Corporation's tests for use in the Navy. Deliveries on this contract are being made well ahead of schedule. In September, 1941, permission to reproduce certain materials for use in the British Army was granted through the British Purchasing Commission here.

Industrial Division. This Division, working in close cooperation with the Test Division, is handling numerous inquiries from industrial concerns regarding employment testing and is rendering consulting services on employment, training, upgrading, and other phases of personnel administration for three aircraft companies and a considerable number of others engaged in war production work.

In appreciation of the services of this Division to one aircraft company, Mr. Richard A. Fear, the staff member serving chiefly on the job, was given a photograph of an airplane being produced, inscribed to him as one who "helped us to turn out more of these faster when they were needed most." In this company, the Division's services included important contributions in testing and interviewing methods applying both to their employment and upgrading procedures. In another airplane company, the Division handled the selection of men for foreign service for specialized maintenance assignments.

In cooperation with the American Management Association, Dr. Paul S. Achilles, acting head of this Division, contributed the chapter on Employment Testing to the Association's volume, "How to Train Workers in War Industries." He also prepared the Employment Procedures Check List and Report Form which was used by the Association in making a survey among over one thousand companies for report at the Association's Annual Personnel Conference in September, 1942. Tabulation of the returns on this survey and preparation of the report are being handled by the Corporation's Industrial Division.

The war effort increasingly demands that all available persons be put to work with the minimum of delays or misplacement. For the purpose of rendering more effective and prompt assistance to companies facing such problems, staff members and assistants in both the New York and Chicago offices of the Corporation have been concentrating for several months on the development and production of a new series of tests and forms especially designed for controlled use in industry. Eleven of these, including four apparatus tests, are now in readiness. Norms are being accumulated and validation studies conducted in a number of companies in which the tests have already been put to use. In this connection it is worthy of note that Dr. Margaret B. Erb of this Division's staff, is pioneering as an industrial consultant regarding women employees; it is hoped that the Corporation may be instrumental in further extending the opportunities in this field for women psychologists. The Industrial Division has also inaugurated publication of an Industrial Service Bulletin in the interest of furthering personnel research.

Marketing Research Division. A study of public attitudes toward the purchase of war stamps and bonds was made by this Division in December, 1941, for the Treasury Department.

Indirect contributions to the war effort have been made through a variety of studies conducted without remuneration by this Division as special research projects, as well as by studies made for private industrial clients. These studies may be summarized briefly as follows:

(1) A nation-wide study of public attitudes toward war-time advertising, with particular reference to the effects of advertising on national morale and the contributions of advertisers to the sale of war bonds. This study was a cooperative enterprise initiated by an organization of national advertisers. The results of the study have influenced advertising policies in several large companies, and their effects can be seen in many recent changes in national advertising.

(2) Several large corporations were seriously concerned over workers' attitudes toward labor union policies and practices in a war-time economy. A nation-wide study was conducted among industrial workers to discover their attitudes toward Labor's policies.

(3) In another nation-wide study, measurement was made of (a) public attitudes toward industry's all-out war effort and (b)

knowledge of the public as to probable effects upon the consumer of the changeover to war production.

(4) On its own initiative, the Division conducted a study of public attitudes toward consumer products, with particular reference to rationing, conservation and product substitutes.

Testing Service Division for Schools of Nursing. There is no question of the need for nurses, nor of the contribution being made by this Division and the many psychologists cooperating with it as Research Associates, in aiding schools of nursing throughout the country in the selection of candidates for training. In the first seven months of 1942, 8,505 candidates were tested by this Division and reports on each candidate rendered to the respective schools to which they were applying. The figures have mounted steadily, and the efficiency of this Division's staff and office force is indicated by its handling a load of 1,278 cases in May, 1,659 in June, and 1,919 in July without increasing its personnel.

Clinical Division (Psychological Service Center). Dr. Rose G. Anderson, Associate Director and staff member devoting full time to this Division, carried a heavy load of cases in June prior to leaving for a summer session teaching engagement at the University of California. The services of the Division are being maintained by other staff members at both the New York and Chicago offices of the Corporation. Of possible significance is an increase in the number of women seeking counsel as to the best application of their abilities in the war effort, and also the visits of several executives concerning personal problems aggravated by the present strain under which they are working in war production.

PERSONNEL WORK IN THE ARMY AIR FORCES: THE CLASSIFICATION DIVISION, ARMY AIR FORCES TECHNICAL TRAINING COMMAND*

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I. INTRODUCTION

The selection problems associated with many of the Air Forces ground crew specialized jobs are quite complex and offer a real challenge to military personnel psychologists. Essential to an effective air arm are well qualified ground crew specialists. These specialists, trained for the numerous duties of maintenance, repair, air photography and communications, are as essential as well qualified pilots, bombardiers, and navigators who comprise the air crew. The selection, classification, and training of these specialists is the responsibility of the Air Forces Technical Training Command. The number and variety of these specialists are far greater than that of the several air crew classifications. For each air crew member in Air Forces combat units, several ground crew specialists are required.

The Army Air Forces Technical Training Command has developed along with the other activities of the Air Forces and with the growth of air power. The Army Air Forces Technical Training Command had its inception in October, 1917, when it was known as the Enlisted Mechanics Training Department. Later it was designated the Air Service Mechanics School. Early in its history the value of scientific personnel selection was recognized. Tests were adopted (e.g., Army Alpha) and developed (e.g., Shop Mathematics); tests and interviewing procedures were administered by its Trade Test Department. This department also had supervisory responsibility over classification procedures. Several articles (3, 4, 5, 6) outline research projects in the development of techniques for the selection of Air Forces specialists performed before the recent expansion of the activities of the Command. In January, 1942, coincident with the beginning of war expansion of

* Carlton Wilder, Ralph D. Norman, Gene A. Waller, Earle A. Cleveland, Wendell L. Gray, and Charles P. Sparks are among the research workers of this Division who have contributed to one or more of the studies summarized in this report.

the Air Forces, this department became known as the Classification Division of the Command.

While specific figures pertaining to inflow of trainees to schools cannot be given for military reasons, the number of trainees that was graduated from one of the score of Air Forces Technical Schools last month was considerably greater than that graduated from any one of our largest universities last June. The volume of applicants thus far selected and classified as Technical School ground crew trainees comprises more than half a million men.

The Division has during the past several years drawn freely from the advisory services of Expert Consultants appointed by The Secretary of War and members of the National Research Council Committee on Classification of Military Personnel; on test and occupational information from the Personnel Procedures Section* of the Adjutant General's Office; and on civilian and military occupational analyses from the Occupational Analysis Section of the United States Employment Service.

It is the purpose of this article to present a picture of the psychological phases of the work of the Classification Division of the Command by describing: the courses of instruction and entrance requirements; the organization of the Division, its control of field activities, and its technical personnel; the psychological problems encountered and methods of test verification; tests in use; and typical research performed.

II. THE TRAINING COURSES AND ENTRANCE REQUIREMENTS

At the present time the primary objective of the Command is to instruct trainees in a score of courses. The schools are located at a number of places throughout the country. The courses are:

Basic Courses:

Airplane Mechanics
Radio Operators and Mechanics
Aircraft Armorers
Machinists
Metal Workers
Teletype Operators
Power Turret Maintenance
Specialists
Link Trainer Operators

Electrical Specialists
Photographers
General Clerks
Welders
Parachute Riggers
Weather Observers
Bombsight Maintenance
Specialists

* Recently the name of Personnel Procedures Section was changed to Classification and Enlisted Replacement Branch. Its Personnel Research Section, responsible for development and use of all classification techniques in Reception Centers, is directed by Major Marion W. Richardson.

Enlisted later dropped

Advanced Schools:

Power Plant Specialists
Aircraft Instrument Specialists
Weather Forecasters

Propeller Specialists
Radio Code Specialists

The first three basic courses listed require slightly over 80 per cent of the total inflow of trainees. The last five items in the list are advanced or post-graduate schools. Trainees for these schools are drawn from among the more successful graduates of certain of the other courses.

A secondary responsibility of the Command is the selection, classification, training, and assignment of statistical officers, administrative officers, and the training of a variety of technicians in various factories; for example, factories for the manufacture of power turret, aircraft gunnery, and bombsight equipment.

Entrance requirements generally consist of minimum levels of performance on tests (to be described on the following pages) although certain experience and previous training as determined by interview are required for some of the courses. For the airplane mechanics course, experience of applicants is helpful in manual training, cabinet making, gasoline engine overhaul, airplane overhaul and assembly, including rigging and repair, general automotive work, machinist work, and toolmaking. Experience as a munition worker, machinist, gunsmith, locksmith, armorer, gunner, typewriter repair worker, or instrument repair worker may be conducive to success in the Armorer School and in the Aircraft Armorer's job duties. Some applicants may by-pass the schools if the interview and employment record show intensive training and adequate experience in civilian counterpart occupations directly related to the military Air Forces specialty occupation.

At the present time all Air Forces Technical School trainees are drawn from inductees after they have spent several days at one of the numerous Reception Centers (2). At this Center they have been given the Army General Classification Test, a Mechanical Aptitude Test, a Clerical Aptitude Test, and have been interviewed to aid in determining the branch of the Service in which the recruit should yield greatest usefulness in combat or related duty. Allotments for the Air Forces Technical Schools are shipped from these centers directly to the Army Air Forces Replacement Training Centers for preliminary training and further classification.

At these replacement training centers the trainees are given a comprehensive interview and a battery of aptitude tests. On the basis of these results the trainees are selected and classified for specialized work or training in one of the 15 basic ground crew courses listed above. The construction, validation, and use of the batteries of aptitude tests employed in the replacement centers will be considered in Section IV below.

III. ORGANIZATION AND PERSONNEL OF THE CLASSIFICATION DIVISION

Organization. The organization of the Classification Division is flexible because of necessary shifts in plans and policies of the Command, and the rapid expansion of the classification program necessitated by greatly increased inflow of trainees. A statement of the functional organization of the Division will aid the reader to interpret methods and procedures used in the field control of classification activities. The work of the Division is adapted to the goal of accomplishing the classification objective with a minimum of lost motion and in such a manner as to enable fixing the responsibility for action. The Division is functionally broken down into three group activities: administration, operations, and methods.

The administrative group activity combines responsibility for plans, policies, and integration of all activities of the Division with the responsibility for accomplishing coordination of plans and policies with all related agencies both inside and outside of the Command and is responsible also for all of the work accomplished within the Division itself.

The operations group activity is responsible for the preparation of statistical reports pertaining, for example, to the inflow and processing of recruits in the field stations; preparation of the Classification Division Bulletins and other publications and releases designed to inform field offices and interested individuals of the activities and methods used by the Division; coordination of activities of personnel technicians and classification officers in the field; participation in formulation of plans and policies for research and establishment of standards with particular reference to articulation of investigations to be undertaken with available technical facilities.

The group activity pertaining to methods is the third unit of the Classification Division. In this group the plans for the devel-

opment of classification tools, and completion of research in construction, verification and refinement of all such classification devices are performed. In addition to the test construction, this group makes field situation analyses for the purpose of performing test validation, obtains data derived from experimental use of tests and other classification techniques, obtains criterion data by directive or by tours of duty in the field stations, and accomplishes statistical analyses of such data as required for continuous verification of the differentiating power of the techniques used in the field. It obtains data resulting in the establishing of norms for the tests, sets up conversion tables for the transmutation of raw test scores into standard scores, and advises the operations group on preparation of manuals and directions for the administration, interpretation, and recording of classification data secured in the field. It also prepares reports on test development and research, and maintains all files relative to test research activities. The group acts in a consulting capacity to the other two groups of the Division, to other offices of the Command and to military authorities outside of the Command; and aids them in developing plans, policies, procedures, and standards for the procurement and classification of recruit trainees for the various Air Forces Technical Training Schools.

Personnel. The personnel now employed in investigations in military psychology for the Classification Division may be divided into two parts. The first comprises a group of professional workers, civilians and officers, employed in the Headquarters office of the Command. At the time of this writing this group consists of four officers and a total of eleven professional workers including four Junior Personnel Technicians, four Assistant Personnel Technicians, one Associate Personnel Technician, one Personnel Technician, and one Principal Personnel Technician. The second group of research workers serve the various Replacement Training Center locations of the Command. At the present time, in addition to commissioned officers detailed to classification duties, five Assistant Personnel Technicians are conducting investigations at these field stations similar to those that are summarized in Part VI of this report.

The qualifications in terms of specific technical training and experience of professional investigators, both commissioned officers and civilians, follow in general the qualifications as set forth in the United States Civil Service Commission announcement for

positions of the various grades of Personnel Technician positions that was distributed by the United States Civil Service Commission in September, 1940.

The Division's specifications of minimum requirements for Assistant Personnel Technicians are:

Training. Four years college work with a major in psychology or psychometrics including a minimum of 10 semester hours in courses in mental measurement in which experience in actual test administration was received, and a minimum of 6 hours in statistics of tests and other personnel measurements. In addition to this training applicants for these positions must have had one year of graduate training in an institution granting graduate degrees in psychology with major field of specialization in psychometrics or personnel psychology including test construction, administration, theory, the statistical analyses of test data and training in interview and rating scale techniques with practice in the use of such tools.

Experience. Two years of full-time paid experience of a responsible, professional nature, in investigations of problems involving classification or selection of personnel or in the administration of classification systems including study of personnel data and application of tests and other techniques for personnel measurement. One year of graduate training in addition to that required to fill the requirement of training indicated above may be substituted month for month up to a maximum of one year for a portion of the experience requirements. Examples of kinds of experience desired in the order of their desirability are:

1. Personnel research in industry or governmental agencies in which classification is performed by means of psychological techniques.
2. Director or Assistant Director or responsible experience in a student personnel bureau in a large college or university.
3. A responsible position in Federal Government or Civil Service or in a large educational testing agency in which psychological techniques are used to appraise and evaluate applicants for their selection, classification, or admission.
4. College teaching in the field of testing, statistical analyses of psychological test data, business or industrial psychology with research, performed in one or more of these fields.
5. Part-time duty as consultant in problems of personnel classification in a governmental agency or industrial or commercial organizations is desirable.

Duties of Assistant Personnel Technicians in the Headquarters of the Command consist of test construction; analysis of personnel data forwarded to the central office by the workers in the field; the preparation of editorial writeups and summary reports; the collation of minor studies conducted and reported by field workers with a view to improvement of testing techniques and personnel procedures used in the service field locations; and under super-

vision the preparation of bulletins and manuals for use by technicians in the field to insure proper and uniform test administration, recording and interpretation of data. Duties may also include the preparation, under supervision, of drafts and directives establishing personnel standards and procedures in the field operating stations.

The duties of the Assistant Personnel Technician field investigators are to: assist school directors and authorities in studying and establishing methods of evaluating school success of trainees with a view to improvement of objectively measured criteria of attainment and improvement of methods for elimination of academically deficient students; work with Records Section heads to study difficulties involved in test score and criterion record keeping, and aid school instructors in meaningful interpretation of test results; study and improve methods of instruction by working with instructors for the purpose of informing them of basic principles in economy of learning as experimentally determined by educational psychologists; perform job analyses and curriculum analyses with a view to the use of workable shortcuts in attainment of desired outcomes of instruction; study operating procedures for recruit classification with a view to their improvement; prepare reports on the several items indicated above for use in establishing policies and standards by the Classification Division, Army Air Forces Technical Training Command.*

IV. PSYCHOLOGICAL PROBLEMS AND METHODS OF TEST VERIFICATION

The program of the Division requires adequate classification of men for a number of different kinds of training. This fact requires a different approach from that conventionally used in selection of men for a single job. Classification, or differential selection, necessitates a larger number of tests and more detailed work in training and job analysis than is ordinarily the case in selection programs. Experiments designed to secure validity information is made more difficult than is usual in selection problems.

Conventional experimental designs are inadequate. A test or battery may appear valid or may be found valid for selecting for one course of instruction, but it may not be known how well this

* Inquiries relative to position vacancies in the Classification Division will be addressed to the Commanding General, Air Forces Technical Training Command, Knollwood Field, N. C.

battery will work in differential selection. The optimal tests and test score weights for screening and sorting for a number of occupations or courses cannot be verified by conventional test-criterion analysis. The classification program requires an approach in which the following procedures are basic:

1. *Training curriculum and occupational analyses.*
 To determine common psychological characteristics which courses require of trainees.
 To determine common psychological characteristics which job assignments undertaken by graduates require of specialists.
 To determine the differential psychological characteristics which courses require.
 To determine the differential psychological characteristics which jobs require.
2. *Test construction for a number of test forms.*
 Preliminary item construction. Based on curriculum and job analyses, items for tests for any specific course or job are designed to test for characteristics peculiar to that course or job alone, and not common to the other courses or jobs.
 Item editing. Items are edited by subject matter experts to aid obtaining items as specified in the preceding paragraph.
 Item analysis, item selection, scaling.
 Reproduction of tests in quantities for experimental use.
3. *Preliminary verification of tests.*
 Administration to experimental populations.
 Analysis of test data for reliability.
 Establishing criteria of success in the schools.
 Analysis of test data for validity.
 Establishing conversion tables for converting raw scores to standard scores.
 Establishing critical standard score levels.
4. *Verification of tests to determine stability.*
 Repeating verification on successive samples to determine sustained validity.
5. *Preparation of manuals for uniform use of the tests in the Replacement Training Center field locations.*
6. *Continuous followup to enable revision of the tests in terms of changes in course requirements and revision of minimum standard score levels in terms of large changes in test measured levels of inflow populations.*

V. TESTS IN USE

The test scores obtained in the Reception Centers follow the men to the Air Forces Replacement Training Centers where additional tests are given. The men come to the Replacement Training Center with their qualification cards on which the preliminary classification test scores have been entered at the Reception

Center. In addition to interview data, standard test scores on the General Classification Test, Mechanical Aptitude Test, and Clerical Aptitude Test are entered on this qualification card. These data are supplemented by additional interview and test information collected in the Replacement Training Center, and the men are routed to the schools for training in specific courses on the basis of this information. All tests are machine scored. The tests now in most common use in Army Air Forces Replacement Training Centers are indicated in Table I.

TABLE I
TESTS IN USE

<i>Test</i>	<i>Form</i>	<i>No. of Parts</i>	<i>Total No. of Items</i>	<i>Time Limit Minutes</i>	<i>Course for which Minimum Scores are Used</i>
Gen. Classification	1a	1	150	40	All basic courses
Gen. Classification	1b	1	150	40	All basic courses
Gen. Classification	1c	1	150	40	All basic courses
Gen. Classification	1d	1	150	40	All basic courses
Shop Math	5-R-I	1	20	120	One of the four forms used for all basic courses except Radio Operator; minimum scores differ for different courses
Shop Math	5-R-J	1	20	120	
Shop Math	5-R-K	1	20	120	
Shop Math	5-R-L	1	20	120	
Surface Development	6-R-C	1	72	20	Sheet Metal Workers Aircraft Welders
Surface Development	6-R-D	1	72	20	Parachute Riggers Photographers
Mechanical Movements	6-R-E	1	67	20	Same as Surface Development
Clerical	7-R-B	5	140	41	General Clerks
Weather	9-R-A	2	134	52	Weather Observers
Radio and Link Trainer	11-R-A	2	294	70	Link Trainer
Mechanical Information	14-R-A	1	100	30	Radio Operator and Mechanic
Radio Code	Phonograph	1	78	9	Radio Operator and Mechanic

In addition to the tests listed in Table I, the following are used in Replacement Centers for research purposes for item analysis; for the determination of reliability; for development of norms, standard scores, and conversion tables; and for determination of validity in classification.

Series of 1-R (11 forms)—general scholastic aptitude	Mechanical Information Exp. 9 & 10
Mathematics TM-IRE	Mechanical Information (AGO-MA-2)
Signal Corps Code Aptitude Test	Mechanical Comprehension (MC-2)
Code Learning Test	Weather Forecasters Entrance Examination
Substitution Test (Adj. Gen. Office-X-1)	Gottschaldt Figures—Thurstone
Mechanical Aptitude (AGO-MA-1)	Scattered X's—Thurstone
Biographical Inventories BI (series 2 through 10)	Physics Test TP-4 RE
Selection and Classification Test 6-R-A	Officer Candidate Test OC-3a
Technical Reading Comprehension Exp. 3 & 4	Pursuit Test Exp. 1
Code Rhythm Exp. 6	Technical Vocabulary Exp. 5
	Mathematics Exp. 7 & 8

VI. TYPICAL PERSONNEL INVESTIGATIONS

The research results of the Division are filed by projects undertaken. Most of them are current, since constantly changing instruction curricula necessitate periodic revision of classification tools. Several of the projects have been selected on the basis of their general interest, and will be summarized below.

Study of failing trainees at Aircraft Armament School (Project No. 16-1941). In this study a population of 689 aircraft armament trainees were used as subjects. Of the 689 students who entered the course, 28 per cent were eliminated for failure in practical or academic examinations.

Columns 1, 2, and 3 of Table II contain results pertaining to comparison of Army General Classification Test* standard scores for eliminated and passing aircraft armament students. This test is designated A.G.C.T. in the table. It may be noted that all of the ten students who had standard scores of less than 100 failed the course. The wash-out rate dropped sharply with increasing Army General Classification standard scores. It decreased from

* Developed by Classification and Enlisted Replacement Branch (formerly called Personnel Procedures Section) of the Adjutant General's Office. This test is discussed in (1).

TABLE II

COMPARISON OF GENERAL CLASSIFICATION TEST AND SHOP
MATH STANDARD SCORES WITH ELIMINATION
RATES OF ARMAMENT TRAINEES

1 A.G.C.T. Standard Score	2 N	3 Per Cent Washing Out	4 Math. Standard Score	5 N	6 Per Cent Washing Out
86-87	1	100.0	60	12	75.0
88-89	0	100.0	64	11	45.5
90-91	2	100.0	68	16	62.5
92-93	0	100.0	72	25	40.0
94-95	2	100.0	76	60	48.3
96-97	3	100.0	80	42	33.3
98-99	2	100.0	84	57	40.4
100-101	25	40.0	88	66	45.5
102-103	29	48.3	92	61	27.9
104-105	37	35.1	96	53	18.9
106-107	35	37.1	100	49	18.4
108-109	51	47.1	104	35	25.7
110-111	42	40.5	108	40	5.0
112-113	37	40.5	112	23	17.4
114-115	50	24.0	116	27	7.4
116-117	36	22.2	120	26	3.8
118-119	50	30.0	124	41	14.6
120-121	48	33.3	128	11	0.0
122-123	50	16.0	132	11	0.0
124-125	39	17.9	136	8	0.0
126-127	19	15.8	140	12	0.0
128-129	28	7.1	No Record	3	
130-131	20	5.0			
132-133	13	7.7			
134-135	12	8.3			
136-137	25	8.0			
138-139	7	14.3			
140-141	10	0.0			
142-143	9	0.0			
144-145	3	0.0			
146-147	1	0.0			
148-149	1	0.0			
150-151	0	0.0			
152-153	1	0.0			
154-155	0	0.0			
156-157	1	0.0			
Total	689		Total	689	

40 per cent for standard scores of 100 or 101 to 0.0 per cent for scores of 140 and above.

Columns 4, 5, and 6 of Table II show the relation between Shop Math test standard scores and washout rates. It is revealed that, of the 289 trainees that had obtained Shop Math test standard scores of less than 90, 45 per cent washed out, as compared to 28 per cent for the entire group. As was the case for Army General Classification Test standard scores, the washout rate decreased with increasing proficiency on Shop Math test. The elimination rate decreased from 75 per cent for Math test standard scores of 60 to 0.0 per cent for Math test standard scores of above 124. Over 50 per cent of the eliminees had scores of less than 88, and 25 per cent of the successful students had scores less than that figure.

In Table III the relation of age and order of preference for the course to the criterion of failure-success is presented. Columns 1, 2, and 3 of this table show these relations for the age variate. The ages of the students ranged from 18 to 36, with more than 50 per cent of the trainees 21 years of age or less. There was no appreciable tendency for either the younger or older students to succeed more frequently in the training for aircraft armorer.

When interviewing the trainee in the Replacement Training Center, he was asked for his relative preference for the courses. This order of preference was entered on a form arranged to provide a record of this information. Directions for obtaining his order of preference were "The following courses of instruction are offered by the U. S. Air Forces. Indicate by number—1, 2, etc.—the order of your preference. Fourteen courses are listed."

Columns 4, 5, and 6 of Table III suggest that order of preference for the course appears to be closely related to the washout-success criterion. For 624, or 91 per cent of the trainees, armament was either the first or second choice of courses. The elimination rate tended to increase sharply from 25 per cent for the men whose first choice was armament to 100 per cent for the men whose fourth choice of training was armament.

The recommendations regarding personnel practices that seemed reasonable as a result of the findings of this project included the suggestion that students whose order of choice is not either first or second for this course should not be entered.

Validity of interview technique in estimating typing proficiency (Project No. 9-1942). One of the entrance requirements for the

Air Forces clerical school is training or experience in typewriting. The problem of getting typists into the Clerical course involves determining which of the recruits passing through Replacement Training Centers are qualified typists. Because of shortage of time and facilities, the large volume of men being processed, and the

TABLE III

COMPARISON OF AGE AND ORDER OF PREFERENCE WITH
ELIMINATION RATES OF ARMAMENT TRAINEES

<i>1</i> <i>Age</i>	<i>2</i> <i>N</i>	<i>3</i> <i>Per Cent</i> <i>Washing Out</i>	<i>4</i> <i>Order of</i> <i>Preference</i>	<i>5</i> <i>N</i>	<i>6</i> <i>Per Cent</i> <i>Washing Out</i>
18	110	30.0	1	483	25.1
19	97	26.8	2	141	24.1
20	63	36.5	3	14	42.9
21	102	31.4	4	2	100.0
22	95	21.1	5	1	100.0
23	66	22.7	6	2	100.0
24	48	20.1	7	0	
25	42	21.4	8	3	100.0
26	18	38.9	9	1	100.0
27	19	31.6	None	42	54.8
28	3	33.3			
29	5	20.0			
30	4	25.0			
31	3	66.7			
32	3	0.0			
33	0	—			
34	1	0.0			
35	2	100.0			
36	1	0.0			
No record	7	71.4			
Total	689		Total	689	

intensive schedule in effect at the Centers, it is not considered practicable to give typing proficiency tests to all trainees.

A second method is used of arbitrary standards of training, experience, or performance, as derived from the recruits' own statements given in the interview. Before such standards could be applied, it was necessary to know the number of typists in the recruit population flowing through the Replacement Training Centers, their degree of proficiency, and also how much faith may be placed in the interviewing technique by which the recruits' estimates of typing speeds are obtained.

Surveys were conducted on representative groups of recruits passing through several Air Forces Replacement Training Centers. Each man was requested to give the following information: (1) amount of formal academic training in typing; (2) length of experience in a civilian position as a typist; (3) the number of words per minute which the individual soldier estimated as his "present typing speed."

In addition to the information elicited above, a study of the actual typing skills of those who claimed any typing proficiency was made. Correlations were computed between the claimed and actual typing speeds. Many of the men had not typed for some time and were out of practice. Many of them typed rapidly but made so many errors as to receive low scores. A few hours or days of practice might have had some effect upon the correlations reported here.

Table IV shows the amount of typist training reported by recruits at three Replacement Training Centers. Table V shows the amount of typing experience reported by the same groups.

TABLE IV
YEARS OF ACADEMIC TYPING TRAINING

Station	N	Years of Training					
		None	0-1	1-2	2-3	3-4	Over 4
X	629	471	107	40	4	1	6
Y	467	377	44	43	3	0	0
Z	495	409	29	19	24	14*	—
Total	1,591	1,257	180	102	31	15	6
% of Total	100.0%	79.1%	11.3%	6.4%	1.9%	.9%	.4%

* 14 men reported with training of "3 years or more."

It will be noted from the per cent row of the table that 4 out of 5 men claimed no formal training of any kind. Only 9.6 per cent had as much as one year of academic instruction in typing.

Nine out of ten of the 1,591 men in this study reported no typing job experience in civilian life. Only 6 per cent claimed one year or more of such experience.

The personnel technician at Station X reported that, after eliminating those individuals who have never had typing training, the average number of months of training was approximately 14. Eliminating those who claim no typing experience, the average

TABLE V
YEARS OF TYPING EXPERIENCE

Station	N	Years of Experience					
		None	0-1	1-2	2-3	3-4	Over 4
X	629	548	52	9	11	3	6
Y	467	429	10	11	5	6	6
Z	495	439	18	10	8	20*	—
Total	1,591	1,416	80	30	24	29	12
% of							
Total	100.0%	89.0%	5.0%	1.9%	1.5%	1.8%	.8%

* 20 men reported with experience of "3 years or more."

number of months or job experience was approximately 19. Only about one-half of those who had typing training appear to have subsequently used this training as a part of their civilian job experience.

Each man in these groups was asked to estimate the number of words per minute he thought he was capable of typing at the time he was classified. These self-estimates, for the three stations, are shown in Table VI.

TABLE VI
SELF-ESTIMATES OF RECRUITS' TYPING SPEEDS

Estimated Speed	Station X	Station Y	Station Z	Total	Per Cent of Total
80 W.P.M.	0	—	1	1	.1
75 "	1	—	0	1	.1
70 "	0	—	1	1	.1
65 "	2	—	0	2	.1
60 "	3	—	0	3	.2
55 "	0	11*	4	15	.9
50 "	6	11	5	22	1.4
45 "	6	8	2	16	1.0
40 "	20	31	11	62	3.9
35 "	13	17	6	36	2.3
30 "	27	26	15	68	4.3
25 "	21	11	11	43	2.7
20 "	28	7	17	52	3.3
15 "	16	2	10	28	1.8
10 "	7	1	10	18	1.1
5 "	0	0	2	2	.1
0 "	479	397	342	1,218	76.6
Total	629	522	437	1,588	100.0

* 11 men reported with estimated typing speeds of 55 or more.

For the 150 men at Station X who claimed some typing proficiency, the mean estimated speed was 29.43 words per minute. The average estimated speed for the 95 men at Station Z who could type was 28.3. Three-fourths of all the men studied asserted that they could not type at all. About 15 per cent of the men claimed that they could type at a speed of 30 words per minute or better, this speed being the minimum desired speed for clerical students upon entering the course.

One of the most interesting aspects of this study pertains to validity of the interview. How does the claimed speed check with the actual speed? It was possible to recall some of the men who stated they could type, and to administer 10-minute speed tests. Net speeds were computed by the standard method of dividing the number of strokes by five to secure gross number of words typed, subtracting 10 for each error, and dividing by the number of minutes allowed for the test. Net speeds for 161 men tested at Stations X and Z are portrayed in Table VII. Examinees at Station Z were allowed three minutes' practice before taking the test.

TABLE VII
NET SPEEDS OF 161 RECRUIT-TYPISTS

<i>Net W.P.M.</i>	<i>Station X</i>	<i>Station Z</i>	<i>Total</i>	<i>Per Cent of Total</i>
65-69	0	1	1	.6
60-64	0	0	0	0.0
55-59	1	1	2	1.2
50-54	1	0	1	.6
45-49	1	1	2	1.2
40-44	3	5	8	5.0
35-39	3	7	10	6.2
30-34	3	10	13	8.1
25-29	4	5	9	5.6
20-24	5	10	15	9.3
15-19	8	10	18	11.2
10-14	11	21	32	19.9
5-9	9	8	17	10.6
0-4	17	16	33	20.5
Total	66	95	161	100.0

It will be noted that, using a speed of 30 words per minute as an arbitrary proficiency level, only about 23 per cent of the men who claimed some degree of typing proficiency could be considered

as potentially satisfactory for admission to the clerical course. If this figure is generalized to all of the cases who claimed to be typists, about 5 per cent of all of the 1,585 men interviewed could type at a rate of 30 words per minute or more. Thus, the best estimate is that probably only about 5 per cent of all men classified at Replacement Training Centers were typists who had speeds of 30 words per minute or more.

If resort is to be made to judging proficiency on the basis of the recruits' own statements, the matter must be investigated of how well self-estimated typing speeds are related to actual typing speeds, and how much over- or under-estimate of speeds exists. At Station X a Pearsonian coefficient of correlation was computed between self-estimated and actual net speeds. The coefficient, for 66 cases, was .485, indicating only a fair degree of association. A similar coefficient of .578 was computed for the data received from Station Z, based on 95 cases.

In connection with the amount of over- or under-estimate entering into assertions regarding typing proficiency, Table VIII is presented.

TABLE VIII
COMPARISON OF AVERAGE SELF-ESTIMATED AND
ACTUAL TYPING SPEEDS

<i>Station</i>	<i>N</i>	<i>Mean Actual</i>	<i>Mean Estimated</i>	<i>Difference</i>
X	66	16.1	30.6	14.5
Z	95	18.9	28.3	9.4

It is seen that at both stations a tendency to over-estimate typing speeds was apparent. At Station X, 59 of the 66 typists claimed speeds which exceeded actual performance. This study, of course, cannot indicate whether this unreliability of self-estimated speed is intentional. Another possible contributing factor was the probable tendency for the individual to indicate the highest speed which he had attained while undergoing intensive academic typing instructions; a natural decline in typing speed, unless typing had continued up to the time of military induction, would be expected.

Several deductions of practical value to the Air Forces clerical schools resulted from the study. If typing proficiency tests cannot feasibly be employed, and if clerical students must be selected partially on the basis of self-estimated typing speeds, some allow-

ance must be accorded the differences between claimed and actual typing speeds. At the same time the minimum acceptable estimated speed must not be set so high as to exclude all but a few students as quota requirements for the school must be met. The average over-estimate in subjectively judging one's typing speed ranged from 9 to 15 words per minute for the above groups. The results are of interest that might obtain for a minimum typing speed 15 words per minute higher than the established standard of 30 words per minute. The following table shows the results of using a self-estimated speed of 45 words per minute as a standard for the 161 typists studied at Stations Z and X:

TABLE IX

EFFECTS OF EMPLOYING A SELF-ESTIMATED TYPING SPEED
OF 45 WORDS PER MINUTE AS A STANDARD FOR
SELECTING CLERICAL STUDENTS

<i>Station</i>	<i>Number of Typists</i>	<i>Total with Est. Speeds of 45 W.P.M. or More</i>	<i>Est. 45 W.P.M. or More Actually 30 W.P.M. or More</i>	<i>Est. 45 W.P.M. or More Actually Below 30 W.P.M.</i>
X	66	11	5	6
Z	95	13	9	4
Total	161	24	14	10

From the above table it may be seen that of 161 men claiming typing proficiency, 24, or 14.9 per cent, assert that they were able to type at a rate of 45 words per minute, or better. Of these 24, 14 were able to exceed 30 words per minute. Ten could not pass the test with a minimum speed of 30 words per minute. The chances are, then, that in assigning to the clerical course 100 men like these who claim a typing speed of 45 words per minute or more, about 60 would probably be able to type at a rate of 30 words per minute or more without further training. Although the remaining 40 would be below this critical mark initially, it is likely that a brief review would raise their speeds to the desired minimum level. As only 61 men in the original group of 1,588 stated that they were able to type at a rate of 45 words per minute or more, this suggests that about 3.8 per cent of all recruits received at Replacement Training Centers could be expected to have estimated typing speeds at this level, provided future recruit ship-

ments were comparable to those men included in this study. It was determined that this percentage of the total inflow of trainees would supply a sufficient number of clerical trainees.

Analysis of marginal recruits (Project No. 13, 1942). The following summary of results of one of several related studies performed by the Classification Division is of a study made on a group of 500 recruits who scored in the lowest five per cent on the Army General Classification Test. These marginal recruits offer serious problems to the military psychologist: some are problem cases, few can be trained as specialists, some already possess skills valuable to the armed forces. The basic objectives are classification and training for maximum utilization of such aptitudes and skills as these recruits possess.

The sample of 500 marginal recruits was given a non-language test. The scores on this test were analyzed in relation to chronological age, years of schooling, years out of school, civilian occupation, and possession of occupational specialties of value to the Air Forces.

The relation of non-language test standard scores of this selected group to chronological age is shown in Table X.

TABLE X
PERCENTAGES OF EACH AGE GROUP FALLING IN EACH
STANDARD SCORE STEP INTERVAL

Age	Non-Language Test Standard Score				Total
	110 to 138	90 to 109	70 to 89	40 to 69	
18 to 20	4.41	4.42	0.78	0.53	2.00
21 to 28	63.24	42.48	45.74	31.58	42.00
29 to 35	29.41	40.71	41.08	51.58	43.40
36 to 44	2.94	12.39	12.40	16.31	12.60
Total	100.00	100.00	100.00	100.00	100.00

There was some tendency for those who placed in the lowest standard score group on the non-language test to be older men. Table X shows that 68 per cent of those in the lowest scoring group were 29 years of age or older, whereas only 32 per cent of those of the higher scoring men were 29 or over.

The men who had received more schooling tended to make better non-language test scores. Only 40 per cent of those who were in the lowest standard score group had received more than

seven years of schooling; this may be contrasted with the fact that 63 per cent of those in the higher non-language standard score group had received eight or more years of schooling.

The number of years out of school also seemed to be related to non-language test scores. Of the lowest scoring group, 64 per cent had been out of school for 16 or more years, while for the highest scoring group, only 21 per cent had been out of school longer than 15 years.

Among the most interesting and important findings of the study are those reported in Table XI. This shows percentages of the total group of men for each of three non-language test standard score intervals who had held various kinds of civilian occupations. The major occupational groups of the United States Employment Service occupational classification structure were employed in the grouping of job titles. Since none of these 500 selected men had been members of professional, semi-professional, managerial or official occupations, and two other occupational groups, these are not included in the table.

TABLE XI

PERCENTAGE OF MEN IN THREE NON-LANGUAGE STANDARD SCORE GROUPS BY CIVILIAN OCCUPATIONAL CLASSIFICATION

<i>Occupation</i>	<i>Non-Language Standard Score</i>			<i>Total</i>
	<i>110 to 138</i>	<i>70 to 109</i>	<i>40 to 69</i>	
Clerical and Related	1.47	0.41	0.00	0.40
Sales and Related	0.00	1.24	1.58	1.20
Domestic Service	0.00	0.00	0.00	0.00
Personal Service	1.47	2.89	2.11	2.40
Agricultural and Related	19.12	33.06	40.53	34.00
Skilled	20.59	22.73	18.42	20.80
Semi-skilled	36.76	16.53	12.61	17.80
Unskilled	20.59	23.14	24.74	23.40
Total	100.00	100.00	100.00	100.00
	68	241*	190	499*

* One recruit had no previous work experience.

It will be noted that over 95 per cent of the entire selected group of recruits were classed as skilled, semi-skilled, or laborers of one kind or another, or were farmers and farm hands. The percentage of unskilled laborers and farmers increased consistently

as the non-language test scores decreased. It would appear that those of lowest mental ability tend to be unable to get beyond a simple type of occupation. Although it is not shown in the table, the data reveal that a large number of the group classed as unskilled laborers had a record of many different jobs and a large amount of unemployment.

One of the more significant results of the study from the viewpoint of military psychology was the proportion of these low grade, marginal men who possessed specialized training of such a nature as to enable them to contribute their skills acquired in civil life to combat or other Air Force units without additional Air Force technical training. It will be recalled that the sample of 500 men studied were selected as being the lowest 5 per cent on the Army General Classification Test received at a certain Replacement Training Center.

Over three-fourths of all "by-passes" (those who do not require Air Force Technical School Training) are either truck drivers or tractor drivers. Truck-driving and tractor-driving are listed as "semi-skilled" occupations by the United States Employment Service Occupational Classification. The other men, with the exception of one Parts Clerk, were "by-passed" in occupations which are listed as "skilled."

Of the total group of 500 who scored among the lowest 5 per cent of the language test, the data reveal that most of the specialists are above standard score of 70 on the non-language test. Only 8 per cent of those below 70 were "by-passed," whereas 23 per cent of those above 70 were assigned to units without formal Air Force Technical School Training.

VII. SUMMARY

The Classification Division of the Army Air Forces Technical Training Command is organized and staffed with a group of military psychologists for developing and applying personnel techniques designed for classifying and training the groundcrews for the Army Air Forces. The volume of inflow of these trainees to replacement training and Air Forces school centers is great—about 11 ground crew specialists are trained for each air crew cadet graduated.

In the development of personnel tests and related techniques emphasis is placed on: analysis of the characteristics of successive populations of trainees; analysis of training courses and specialist

duties to be performed by graduates; procedures for standard and uniform administration, interpretation, and recording of test and school criterion data; and continuous follow-up studies to check, verify, and refine techniques in use.

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RADIO BROADCAST ON "PSYCHOLOGISTS IN THE WAR EFFORT"

BY STEUART HENDERSON BRITT

Executive Director, Office of Psychological Personnel, National Research Council

"Psychologists in the War Effort" was the subject of a nationwide broadcast on Saturday, July 11, 1942, 1:30 P.M. Eastern War-time, by the Executive Director of the Office of Psychological Personnel. He was the guest speaker on the "Adventures in Science" program, a weekly broadcast over the Columbia Broadcasting System for the past twelve years under the auspices of Science Service. Asked by Watson Davis, Director of Science Service, to describe the activities of the newly created Office of Psychological Personnel, he took the opportunity to tell briefly what psychologists are doing in the war effort.

Since the material may be of use to other psychologists in our public relations program, the radio script is reproduced below:

DAVIS: Our guest today is Dr. Steuart Henderson Britt, of Washington, D. C. Dr. Britt is engaged in a great many war activities, and is the Executive Director of the Office of Psychological Personnel located here in Washington. He is going to tell us about the work of psychologists in the war effort. First of all, Dr. Britt, what is this Office of Psychological Personnel?

BRITT: The answer is, Mr. Davis, that the Office of Psychological Personnel is a special office established in Washington, D. C., by the American Psychological Association in cooperation with the National Research Council. In fact, we are located in the building of the National Research Council. The Office of Psychological Personnel was set up to assist psychologists throughout the country on various personnel problems, to give them information about opportunities for service in the Army, the Navy, other branches of the Federal government, and in various research projects. Although the Office of Psychological Personnel is not a governmental agency, we have worked in the closest cooperation with both military and non-military branches of the Federal government on problems directly related to the war effort.

DAVIS: What do you mean, Dr. Britt, when you say that you have worked with these agencies?

BRITT: The Office of Psychological Personnel is charged with the responsibility of "the maximum, effective use of psychologists in the war effort." This means that we have supplied lists of

psychologists and other special information to various war agencies. For example, we have furnished the Adjutant General's Office of the War Department with names of qualified psychologists who are today carrying on classification and personnel work in the Army. Likewise, we have secured factual information for the Office of the Air Surgeon of the Army Air Forces. These same sorts of contacts have been maintained with other branches of both the Army and the Navy.

DAVIS: Do you mean that federal agencies turn to the Office of Psychological Personnel for assistance on psychological problems, Dr. Britt?

BRITT: Yes, Mr. Davis. But I must also point out that the National Roster of Scientific and Specialized Personnel, a governmental agency, has the primary task of supplying names of men and women in *all* scientific and technical fields in connection with the war effort. The National Roster is under the direction of Dr. Leonard Carmichael, internationally known psychologist, and of Mr. James C. O'Brien, Executive Officer. It has recently become a part of the War Manpower Commission, and is concerned with the most effective use of all scientifically trained persons in the national emergency. Fortunately, the Office of Psychological Personnel has direct relationships with the National Roster of Scientific and Specialized Personnel, and is the channel used by the Roster in supplying information to war agencies about psychologists.

DAVIS: This sounds as if you had your hands full.

BRITT: We certainly have, although the real job of carrying on psychological activities is being done by the loyal men and women in the psychological profession who, by the hundreds, have gone into war activities. The Office of Psychological Personnel serves as a kind of "clearing house" for psychological problems, but I must emphasize that the most important tasks are those being performed by the psychologists in uniform, and by others in important civilian posts.

DAVIS: Tell us, Dr. Britt, just what do these psychologists do?

BRITT: Suppose I answer, first of all, by telling what psychologists do *not* do. Psychologists are not highbrow fortune-tellers or crystal-gazers, and they don't go around hypnotizing people or asking to interpret their dreams. I'm afraid that is the strange notion some people have about us. Some persons are even

convinced that psychologists must be "queer ducks," or else why would they be psychologists?

Yet actually the three or four thousand psychologists in the United States are practical, hard-headed men and women who have gone through years of rigorous scientific training, and they are at work on some of the most practical problems of human behavior. Psychologists are found not only in the laboratories and the classrooms of the colleges and universities, but also in guidance clinics, in hospitals, in courtrooms, in prisons, in factories, and in market research organizations.

DAVIS: It's not surprising, then, that psychologists are in demand in the war effort.

BRITT: You're quite right. Today the Federal government is the largest single employer of psychologists. Although a number are stationed in Washington, many others are located in other sections of the country, both in military and in non-military capacities. First of all, a great many are engaged in developing and interpreting special psychological tests. These tests are used especially in the armed services. Men must be selected; they must be classified; and then they must be trained. In selection, classification, and training programs psychologists are doing their best to see that the square pegs go into the square holes, and the round pegs into the round holes.

The Adjutant General's Office, the Army Air Forces, and the Air Corps Technical Training Command of the War Department; and the Bureau of Medicine and Surgery, the Bureau of Aeronautics, and the Bureau of Naval Personnel of the Navy Department; these and other military branches are vitally concerned with the correct selection and classification of men. And this is where psychologists have been of very real help with their intelligence tests, their aptitude tests, and their performance tests.

DAVIS: How many psychologists are in the Army and Navy, Dr. Britt?

BRITT: Several hundred. Over fifty psychologists have been commissioned in various branches of the Navy. About two hundred and fifty are serving as officers or are being commissioned in the Army. And I might add that most of these officers have gone through basic military training before receiving their commissions. In addition, a great many young psychologists are serving as enlisted men and non-commissioned officers, carrying on psycho-

logical duties of the greatest importance; and some are serving with combat troops.

DAVIS: You said awhile ago, Dr. Britt, that psychologists are also performing non-military duties.

BRITT: When I said non-military, I meant that they were carrying on psychological activities as civilians. In fact, some of the most important work is being done by men and women *not* in uniform. Significant research projects—especially on problems of perception—are going forward in psychological laboratories throughout the United States. I am not at liberty to describe the research because most of it is necessarily secret in nature, but I am happy to say that much of it is being done at the request of and under the supervision of the War and Navy Departments.

Then there are a great many persons working in the field of social psychology. This includes studies of morale, the measurement of public opinion and attitudes, and the analysis of propaganda. This work is also of a confidential nature, but again I am glad to say that social psychologists, along with other specialists, are making a very real contribution to total war.

DAVIS: Apparently the men in your profession are doing a swell job.

BRITT: Not only the men, Mr. Davis—the women, too. Although the demands in the Army and Navy quite naturally have been for men, the women psychologists are also serving in many ways. Some hold responsible positions advising on war problems, while others have volunteered their services to work in their own communities on local problems of defense and morale.

In this connection, I want to point out that psychologists, both men and women, have *volunteered* their services in ways too numerous to mention. In addition to their regular full-time jobs, a great many have worked long extra hours without pay in the interests of our country. And a great many psychologists began their volunteer work at least two or three years ago, back in the days when lots of people were talking about a "phony war."

DAVIS: It sounds to me as if a fascinating story ought to come out of all this, as to what the psychologists have accomplished in helping to win the war.

BRITT: I wish that story could be told now, but after the war is over there will be a great many things to tell. We can then describe exactly what psychologists have done in the war effort.

And equally important, we can then take stock of all our findings, and I feel sure we will have discovered many new and important developments for the profession of psychology.

DAVIS: We are glad to learn from you, Dr. Britt, about the profession of psychology, and I want to thank you for being with us today.

ANNOUNCER: You have been listening to Dr. Steuart Henderson Britt, Executive Director of the Office of Psychological Personnel, located in the National Research Council, Washington, D. C. Dr. Britt has been interviewed on our "Adventures in Science" program.

PSYCHOLOGY AND THE WAR: NOTES

In the July, 1942, issue of the *Psychological Bulletin* (pp. 525-528) Selective Service Occupational Bulletin No. 10 was quoted in full. This Bulletin deals with the subject of scientific and specialized personnel, and lists psychology among the critical occupations.

Another release from the National Headquarters of the Selective Service System of interest to psychologists is Memorandum to All State Directors (I-435), dated July 15, 1942. In this Memorandum are listed "essential activities," such as: the production of aircraft and parts; food processing; metal mining; etc. Among the list of essential activities, the following three paragraphs may be of particular interest to psychologists:

Health and welfare services, facilities and equipment: Water supply and sewerage systems; irrigation systems; dental and medical laboratories; hospitals; nursing services; fire and police protection; public health services; weather services; coast and geodetic services; engineering and other testing laboratories; offices of dentists, physicians, surgeons, osteopaths, chiropodists and veterinarians; professional engineering services. Includes also the manufacture of X-ray and therapeutic apparatus, and of surgical, medical, and dental instruments, equipment and supplies.

Educational services: Public and private vocational training; elementary, secondary, and preparatory schools; junior colleges, colleges, universities, and professional schools; educational and scientific research agencies.

Governmental services: Including services necessary for the maintenance of health, safety, and morale, and the prosecution of the war.

The Council on Intercultural Relations is interested in collecting, as rapidly as possible, materials on the existing stereotypes and attitudes of the American people toward the cultures and the individual members of countries engaged in the present war. Techniques to be used would include: attitude tests, projective techniques, association tests, collections of informal essays, multiple choice and completion tests, interviews, collection and analyses of current newspaper and moving picture materials. The projected studies could be made in any part of the United States, on any scale, by a single research worker or by a team, using graduate or undergraduate help. The results will be organized in their bearing on the conduct of the war on the psychological front and upon postwar reconstruction. Will psychologists able to cooperate, on a small or large scale, please write at once to: The Secretary, Council on Intercultural Relations, 15 West 77th Street, New York City. Results should be sent in early in December.

Are you engaged in any type of war work? If so, you are urgently requested to write to the Office of Psychological Personnel at once. In order to give adequate information to our colleagues around the country, it is desirable that manuscripts be submitted for the "Psychology and the War" section of the *Psychological Bulletin* covering all phases of psychological work related to the war effort. If you have ideas for an article or a completed manuscript, please send your materials at once to the Office of Psychological Personnel, National Research Council, 2101 Constitution Avenue, N.W., Washington, D. C.

BOOK REVIEWS

THORNDIKE, E. L. *Human nature and the social order*. New York: Macmillan, 1940. Pp. xx+1019.

Of recent years psychologists have shown new recognition of the problem of the place of value in a world of facts—or, as the present reviewer would prefer to phrase it, the place of facts in a world of values. Köhler's William James lectures in 1934, Thorndike's presidential address to the AAAS in 1935, Hartmann's presidential address to the SPSSI in 1939, not to mention tests such as the adaptation of Spranger made in Allport and Vernon's *Study of Values*—these are signs of this renewal. As early as 1865 Fechner recognized that valuing is a form or an aspect of a person's behavior legitimately falling within the purview of the psychologist's inquiries, and it has been explicitly assumed by experimental esthetics ever since.

The work before us has obviously grown out of the insights and inspiration of the same author's aforementioned address.* Some passages in Chapters 6, 13, 14, and 15 come from that source, often verbatim. This philosophical viewpoint may be suggested in a few quotations.

"Judgments of values . . . antedate judgments of existence or 'mere fact' in the animal kingdom and in man. . . . They usually . . . refer to and depend upon satisfactions and annoyances, desires for and against" (pp. 340-41). "The natural sciences have not become scientific by eschewing valuation" (349). "The sciences of man prefer to observe the facts of choices . . . rather than assume in advance any speculative doctrines about their causes" (339). "We have the possibility and desirability of a natural science of values" (p. 347).

But this accurately titled volume concerns not only "human nature" but also "the social order." "Much of the work of improving the world consists in using the abilities of men to gratify their good wants; and many of the problems which economics, government, law, business philanthropy, and education refer to psychology concern the nature, causation, and modification of either abilities or wants" (4). While Part I, of 15 chapters and 400 pages, is devoted to the descriptive analysis of man's nature, Part II, of 23 chapters and 563 pages, sets forth the author's reflections on political and social problems.

Readers with psychological training will recognize most if not all of the Thorndikean concepts presented in Part I: S→R's, the abilities of men; their factors or components; their measurement in extent, goodness, or level; their populational frequencies and individual differences; man's fundamental wants; the action of satisfiers and of annoyers (with recognition of recent critical findings); generous emphasis on "the influence of the genes"; and the like.

Part II, on the other hand, furnishes the beginnings of a "science of Philanthropy," opening with materials taken from one of the author's earlier articles† on "the Good Life," and arguing for what amounts to an approach to that classic ethical ideal by a method quite other than classical.

* Thorndike, E. L. *Science and values*. *Science*, 1936, 83, 1-8.

† Thorndike, E. L. *The goal of social effort*. *Educ. Rec.*, 1936, 17, 153-168.

Thorndike analyzes many phases of social life, especially the economic and the political: the welfare of communities, eugenics, treatment of criminals, distribution of income, supply and demand, capital, psychology of labor, of management, the producer-consumer relation, wage ratios, money as a measure of values and preferences, ownership, the ruler-ruled relation, the representative-represented relation, criteria of good government, utilization of persons of superior ability, law and science, the prudent or reasonable man, legal inventions, social justice, reform—these are but a few picked almost at random.

The reader will be disappointed if he expects to find—as he may feel that he has encouraged to find by the fact of inclusion of both Parts in one volume—any clear corollaries or deductions from the psychological survey to these sociological problems. It is as if the author, after insuring that his readers are not too unsophisticated psychologically in a general way, now turns away to a different field of problems. The psychological part is not a prerequisite to the reading of the social part; and the not infrequent reference to how “the psychologist” does or would think about a given social problem might accurately be re-written, how “one man (incidentally a psychologist)” does or would think about it.

The scientific “trustee for humanity” is followed as he analyzes this and realistically appraises that, but his examinations do not lead to increasingly generalizable statements of findings; and the over-500 pages yield no single summary nor formula. They do furnish a superabundance of sapient, discerning, clean-cut and clearly expressed, frequently-stimulating, unflinching-interesting, observations which have the refreshingly turned literary expressions and the persistent attempt at the concreteness and at quantification of statement that are peculiarly Thorndikean. This is not, then, the system of doctrine, the set of blueprints for this or a post-war world, that some readers might have hoped. Indeed, there is so little of the doctrinaire about it that this reviewer finds it impossible fairly to pigeon-hole the book in terms of the various socio-politico-economic classifications, beyond noting that it could not have been written by a Fascist nor by a Communist. To be sure many quotations could be set up. “Government intervention is now much more fashionable . . . [but] *other things being equal*, the less of it the better” (762). “Psychology finds little kinship between *vox populi* and *vox dei*” (793). “Equality is a false and useless God for philanthropy . . . is a fantastic goal” (416). “The myth of capital as the oppressor rests upon . . . a misconception” (580). But these are all torn from contexts.

No, this is a book to be opened at any chapter or section, and to be read for the pleasure of its variety and wealth of citation, quotation, and whimsical illustration, and for the clarity and incisiveness of its analyses.

JOHN F. DASHIELL.

University of North Carolina.

NICOL, E. *Psicología de las situaciones vitales*. Mexico City: El Colegio de México, 1941. Pp. xxv+211.

Professor Nicol's offering is a contribution to the conceptual aspect of concrete psychology. Illustrating the fresh and penetrating sophistica-

tion of many Latin-American psychologists, it also exemplifies a Latin-American approach that is perhaps beginning to assume the proportions of a tradition. This approach is dynamic; it emphasizes developmental, social, and cultural factors, and possesses a strongly personalistic flavor. Its novelty of insight is due in no small part to its interesting history, which is incidentally revealed in this introduction to the analysis of "life situations."

In so far as the kind of dynamic psychology now prevailing in the United States as a "working" psychology centers in the concept of adjustment, it derives from functionalism and has some of its roots in James. A popular end-product is the "integrated personality." This end is also regarded by Professor Nicol (as by other Latin-Americans), but in the present instance the non-biological derivation is from German characterologists (Spranger, Klages) and *Geisteswissenschaftler*, and ultimately from James's fellow-dissenter from associationism—Bergson! The difference in pedigree furnishes decidedly novel and provocative effects.

In the first chapter, "Experience, Space, and Time," the author reviews Bergson's radical effort to formulate concrete experiences, comments on the philosopher's failure to capture immediacy by his inevitably analytical method, and points out that *Gestalt* psychology has explained the failure ("there are no sensations"). The second chapter, "Temporality and Action," validates Bergson's activism while revealing his inept characterization of the *present*. The third, "On the Living (Being) and the Structure of Life," shows that the present, and hence experience, like temporality and spatiality, are essentially properties of the *person* and must be so understood. The next chapter develops this personalistic approach, and outlines the treatment of all psychological relations in terms of the *situation*. The situation, which has numerous psychological dimensions, is strongly suggestive of Stern's "person-world relation" as a property of "life space." Many situations, however, with their varied dimensionality, may coexist. A final chapter discusses destiny and the characterological analysis of situations.

One is struck by the fact that the word "situation," although not yet a technical term in the English psychological vocabulary, is so profusely used in American works that it is fast becoming a special concept. Professor Nicol's elevation of the word to this rank, in connection with his happy usage of it, thus appears to be a methodological contribution of considerable importance. It is a term that promotes the convergence of diversified categories because it attracts a large array of adjectives (e.g. fundamental, limited, permanent, transitory, economic, social, etc., etc.). "Life situations" are distinguished basically into "fundamental" and "limited" situations; the person is both generic and individualized. The psychology of the person is the locus of his action and outlook "in situations" of many kinds. A situation's makings are partly environmental processes; it is vitalized by an act of choice.

The American reader will miss in all this the familiar references to some adjustive polarity of individual and environment such as belongs to his own psychological tradition. Without in the least contravening biological realities, the omission seems to this reviewer to provide for

richer *psychological* characterization while cutting a great deal of red tape. The flexibility and delicacy of the new conceptual approach also gets away from the mechanicalism of certain leading doctrines. This is strikingly shown in a passage that illustrates the advantages of the concept of "situations" in contrast to the usual description of "complexes" (in depth psychology).

Another omission, for which it is difficult to account, is the author's seeming complete unawareness of the contributions of William Stern, Kurt Lewin, and other personalistically oriented psychologists. The failure to refer to American theories of personality that are somewhat in alignment with the psychology of life situations may be charged fairly to American ignorance of and lack of curiosity about the work of Latin-Americans. This can be repaired in time. It might be said that the very exclusion has worked to the advantage of the Latin-Americans, for it has helped to sharpen up the outlines of a distinctive and promising "tradition." Incidentally, the psychologist who is literate in Spanish has in store an adventure in appreciation on discovering the effectiveness of this language for psychological purposes. Professor Nicol's special interest is the psychology of adolescence, and an application of his theory of life situations to this field, when forthcoming, should prove valuable to all developmental psychologists and students of personality.

American International College.

HOWARD DAVIS SPOERL.

SHUTE CLARENCE. The psychology of Aristotle: an analysis of the living being. New York: Columbia Univ. Press, 1941. Pp. ix + 148.

In this brief essay the author sets himself the task of describing Aristotle's psychology within a system comprised entirely of activities of the living organism. His theme, then, is behavior interpreted in terms of interaction between the organism and the environing world. Aside from the discussion of various philosophical problems which interested Aristotle in connection with biological phenomena, the present book is concerned with such psychological occurrences as sensing, thinking, remembering, the relation of mind and body, etc., all of which are treated as objective phenomena. In each instance these psychological materials are described as activities of organisms fulfilling their functions as definitely engendered and growing animals.

For two reasons the author is to be commended for carrying through his objective treatment. In the first place, this procedure bespeaks a close preoccupation with Aristotle's actual texts. Secondly, the study of Aristotle and his work as mirrors of Greek culture is a much needed antidote to the prevailing custom of misinterpreting Aristotle as the inventor of medieval doctrines.

Indiana University.

J. R. KANTOR.

ROETHLISBERGER, F. J. Management and morale. Cambridge: Harvard Univ. Press, 1941. Pp. xxii + 194.

To those who are acquainted with the record of fifteen years of research in the Hawthorne plant of Western Electric, this thin volume will

bring little new save an excellent summary and a nostalgia for the days when 'morale' had to do chiefly with conditions in industrial production. To those who have missed *Human Problems of an Industrial Civilization* and its lineal descendants, Roethlisberger's manuscript is almost certain to open new and exciting pathways.

Introductory chapters recite the background of a decade-and-a-half of intimate industrial research and tell again the story of the relay room where production continued to increase in the face of conditions that were made 'adverse.' The reader learns that the meaning of an industrial change can be more important than the change itself; that the latent content of an industrial interview can be more meaningful than the manifest content; and that the sentiments of workers are dynamic in nature and ill suited to control by logic. The importance of the informal social organizations among workers is clearly demonstrated, as is the significance of hours and wages as carriers of social values. The concept of social distance is ably discussed and the problem of communication 'up' and 'down' within the industrial organization is thoughtfully treated. The chapter "Of Words and Men" warrants reading by any social psychologist and most particularly by those social psychologists who deal with industrial or military problems. The author adds little, however, either to his own stature or to the significance of the volume in those chapters which deal with the systematic interpretation of the facts and principles presented in the earlier chapters.

As a volume which presents a collection of lectures, Roethlisberger's book achieves about as much coherence as any such volume does—which is to say, very little. An earlier volume was criticized because he and his associates ignored work done elsewhere. In the present volume this becomes an irritating provincialism, dealing with a world which begins and ends with those who have trod the revered corridors at Cambridge and ignoring all others, from the British Industrial Health Board to certain able compatriots in industrial psychology. There is so much able writing in the book that one resents the occasional and florid lapses which lead the author to write of the Hawthorne work as a "revolutionary idea" discovered *de novo* in 1928 and to add that "In that year a new era of personnel relations began." Such appraisals would better be bestowed by others and not eagerly appropriated by one of the progenitors of the "New Era."

One hopes that many will read this volume, particularly if they are unacquainted with its predecessors. Those who do will mark it as an important contribution to the study of human behavior—social human behavior—in industry. There will be some who will agree with this reviewer in assigning this and its companion volumes a place within active reach on the shelf of imperative references. At the same time, one would be gratified if the place in the war effort earned by this research should lead the author to discover the broad lands that lie beyond the Charles and the writings of those who have labored elsewhere in studying complex human interrelationships in the world of work.

JOHN G. JENKINS.

U. S. Navy Bureau of Aeronautics.

HILDRETH, GERTRUDE. *The child mind in evolution: a study of developmental sequences in drawing, with many illustrations.* New York: King's Crown Press, 1941. Pp. vi + 163 + 26 pp. plates.

In this longitudinal study of the development of one form of creative expression in a single child, Hildreth has made an interesting contribution to the literature on children's drawings. The data of her investigation consisted of a series of 4022 drawings made by one boy between the ages of two and eleven years. Of these, 2239 were drawings of locomotives and trains. It is with this group that the study is chiefly concerned.

After a brief description of the child's personality and interests and of the conditions under which the drawings were made, the author presents a brief summary of the main characteristics of the drawings made in each successive year. A roughly quantified indication of growth in drawing is given in terms of the number of new features appearing at each age. The associated development in numbering, and writing, as shown by the titles and labels on the various drawings is also discussed, and several stories and poems about trains, written toward the end of the period, are reproduced. The final chapter, entitled "Psychological Interpretations" deals with a number of special topics such as the tendency to draw the whole structure, the interlocking processes of differentiation and synthesis, the growth of perception and of concepts as revealed in drawing.

A bibliography of 24 titles is followed by 26 pages of reproductions of the child's drawings, grouped according to the age at which they were produced.

FLORENCE L. GOODENOUGH.

University of Minnesota.

CHAMBERS, E. G. *Statistical Calculation for Beginners.* Cambridge, Eng.: Univ. Press (Macmillan), 1940. Pp. viii + 110.

This little book differs markedly from the usual text in elementary statistics. It is better written, being much more concise and effective. The contents are differently selected, as will be pointed out. And finally, in the inclusion of material on such topics as partial correlation, biserial correlation, eta, and contingency, it goes beyond the ordinary introductory text.

The reviewer is not particularly impressed by the tendency of authors to prepare elementary statistics books with the assumption that students will have just the barest mathematical training and ability. There is something particularly unrefreshing about volumes which present verbalizations on statistics, while avoiding the subject-matter of statistics. In this respect, in spite of the blurb, Chambers' book is less offensive than most of our elementary texts. The author succeeds in presenting many of the basic concepts, although he avoids the mathematical derivations.

The book leans heavily upon the various published works of R. A. Fisher and of Yule for reference material, tables to be consulted, and proofs of formulas. Reference is made to Pearson's tables, even for the simpler handling of normal curve relationships. The omission of proofs results in emphasis upon arithmetical processes, and neglect of some im-

portant concepts. In the average textbook, such omissions often result in an unfortunate idea of the nature of statistics; Chambers, however, does seem to avoid this pitfall.

The traditional material on measures of central tendency and variability is presented very briefly and descriptively. The treatment of the normal distribution is unusual, since it omits the customary abbreviated tables of normal curve functions and all the usual accompanying discussion, and offers little beyond a sample of the technique of testing for normality by the method of moments. This discussion is good, but one doubts that it will be very meaningful to those with little training in mathematics. Even the notation of statistics is difficult for such students, and there is a limit to the extent of penetration in the field of statistics by persons unfamiliar with the most simple mathematical processes.

The treatment of the significance of differences between means is conservative, as is also the discussion of correlation. The author has been more successful than most writers in presenting the fundamental idea of sampling and inference. There is a very clear account of regression and the correlation ratio, and an excellent section is devoted to discussion of contingency methods. The numerous exercises in the use of Chi-Square are good learning materials. The book is characterized generally by simple problems worked out for the student, and suitable exercises to illustrate and clarify the fundamental methods.

Finally, it should be noted that although Chambers has not assumed a prerequisite knowledge of mathematics, he has implicitly assumed that the students will be intelligent. As a result, his book is brief, clear, interesting, and useful.

HAROLD D. CARTER.

University of California.

PETERS, C. C., and VAN VOORHIS, W. R. Statistical procedures and their mathematical bases. New York: McGraw-Hill, 1940. Pp. xiii+516.

Peters and Van Voorhis have perceived an important problem, how to teach an essentially mathematical subject to students without mathematical preparation. It cannot be said that their text provides a definitive solution. The first chapter gives a fairly accessible introduction to the differential and integral calculus, though it may not enable the average student to follow all of the calculus which appears later in the text. The most notable omission is a chapter on theory of probability, which is the mathematical basis of all statistical inference.

The authors recommend that the student read Fisher's article on "Inverse probability," "which he will not find very difficult." (139.) The substance of Fisher's article is that knowledge of population parameters enables us to assign probabilities to statements about sample values; knowledge of sample statistics does *not* allow us to make probability statements about population values but does affect our degree of belief in hypotheses about populations. Peters and Van Voorhis assign probabilities to statements about population parameters on pages 137, 175, 186, 187, and elsewhere. For example, "A ratio of 0.7 between a

difference and its standard error indicates chances of only 3.1 to 1 that the true difference lies in the same direction." (184.) Use of inverse probability obscures the important question, not mentioned in this book, of how large the true difference must be in order to have a reasonable chance of being detected with a sample of a given size.

The assumptions underlying statistical techniques are consistently difficult to find, and in some cases the examples involve straightforward violations of assumptions. The fundamental additive assumption of factor analysis is presented not as an assumption but as a conclusion, and no attempt is made to examine its meaning in relation to various types of psychological data. Similarly, the criteria for simple structure are presented as arbitrary rules for rotation without any psychological rationale. The reader is not informed that there are any limitations to the use of the critical ratio; all sorts of differences are divided by their standard errors and interpreted as if any such ratio were normally distributed. In the section on the significance of the difference between percentages, the percentages compared happen to be 99.48 and 97.65, too high to permit an assumption of normality even for the relatively large number of cases involved. Another misleading numerical example is the illustration of chi-square in Table XXXV. Although on page 417 we find, "The chi-square technique is not sound unless the numbers in the cells are reasonably large," on page 411 the theoretical frequency in each cell is two.

The organization of topics is novel if not entirely logical or convenient. Chapters on correlation theory are interspersed with chapters on sampling error theory; and while standard errors are interpreted in terms of the normal distribution in chapters V and VI, the normal curve is not derived until chapter X. The use of Student's and Fisher's tables of t is described at length in chapter VI, "The reliability of differences," but instructions for entering the table when t is used to compare two unmatched groups are not given until chapter XII, "The analysis of variance."

This book can hardly be recommended to research workers, for instructions for the use of formulas and tables are not readily accessible; nor to beginning students, for the number of sheer mistakes is larger than one expects to find in print. But persons who already have considerable background in statistics will find some of the derivations original and the sequence of topics in some cases provocative of new insight.

University of California.

JANE LOEVINGER.

BOOKS AND MATERIALS RECEIVED

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BRYAN, W. L., LINDLEY, E. H., & HARTER, N. On the psychology of learning a life occupation. Univ. Indiana Publications Science Series No. 11. Bloomington: Univ. Indiana, 1941. Pp. 129.

CRUZE, W. W. Educational psychology. New York: Ronald Press, 1942. Pp. xvi+572.

GOODENOUGH, FLORENCE L., & MAURER, KATHARINE M. The mental growth of children from two to fourteen years. Inst. Child Welf. Monogr. No. 20. Minneapolis: Univ. Minnesota Press, 1942. Pp. xv+130.

GRAY, J. S., *et al.* Psychology in use. New York: American Book, 1941. Pp. xii+663.

HOLLINGWORTH, LETA S. Children above 180 IQ Stanford-Binet: Origin and development. Yonkers-on-Hudson: World Book, 1942. Pp. x+332.

HURLOCK, ELIZABETH B. Child development. New York: McGraw-Hill, 1942. Pp. xiv+478.

JORDAN, A. M. Educational psychology (3rd ed.). New York: Henry Holt, 1942. Pp. xviii+597.

LUCK, J. M. (Ed.), & HALL, V. E. (Assoc. Ed.). Annual review of physiology, volume IV. Stanford University: American Physiological Society and Annual Reviews, Inc., 1942. Pp. vii+709.

MCCALL, W. A., & HERRING, J. P. Comprehensive curriculum test: For junior and senior high schools. Manual. New York: Bureau of Publications, Teachers College, Columbia Univ., 1942. Pp. 11.

MCCALL, W. A., & HERRING, J. P. My personality growth book: For junior and senior high schools, colleges, adults. Manual. New York: Bureau of Publications, Teachers College, Columbia Univ., 1942. Pp. 18.

MCCONNELL, T. R., SCATES, D. E., & FREEMAN, F. N. The conceptual structure of educational research. Suppl. Educ. Monogr. No. 55, May, 1942. Chicago: Univ. Chicago. Pp. vii+47.

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- MORGAN, J. J. B. *Child psychology* (3rd ed.). New York: Farrar and Rinehart, 1942. Pp. xvii+588.
- MUENZINGER, K. F. *Psychology: The science of behavior.* New York: Harper, 1942. Pp. xi+441.
- NAGGE, J. W. *Psychology of the child.* New York: Ronald Press, 1942. Pp. xvi+530.
- POFFENBERGER, A. T. *Principles of applied psychology.* New York: Appleton-Century, 1942. Pp. xvi+655.
- POLYAK, S. L. *The Retina.* Chicago: Univ. Chicago Press, 1942. Pp. x+607.
- REIK, T. *From thirty years with Freud.* London: Hogarth Press, 1941. Pp. 214.
- RICHMOND, WINIFRED V. *Making the most of your personality.* New York: Farrar and Rinehart, 1942. Pp. vi+247.
- SACHS, H. *The creative unconscious.* Cambridge: Sci-Art Publishers, 1940. Pp. 240.
- SCHILDER, P. *Goals and desires of man.* New York: Columbia Univ. Press, 1942. Pp. 305.
- SEVENING, C. *The flamboyant tree.* New York: Margent Press, 1942. Pp. 207.
- WATKINS, J. G. *Objective measurement of instrumental performance.* *Teach. Coll. Contr. Educ. No. 860.* New York: Bureau of Publications, Teachers College, Columbia Univ., 1942. Pp. x+88.
- WATSON, G. (Ed.). *Civilian morale. 2nd Yearbook Society Psychol. Study Social Issues.* Boston: Houghton Mifflin, 1942. Pp. xii+463.
- WISE, C. A. *Religion in illness and health.* New York: Harper, 1942. Pp. xiv+279.
- WRENN, H. A. *Vocational aspiration levels of adults.* *Teach. Coll. Contr. Educ. No. 855.* New York: Bureau of Publications, Teachers College, Columbia Univ., 1942. Pp. vi+150.

NOTES AND NEWS

DR. C. C. BUNCH, research professor in education of the deaf in the School of Speech at Northwestern University, died on June 14 at the age of fifty-seven years.

DR. WILLIS D. ELLIS, assistant professor of psychology, University of Arizona, died on Tuesday, July 21.

DR. C. E. FERREE died July 26 of coronary occlusion at the age of sixty-five years. He was director of the research laboratory of physiological optics, Baltimore, Maryland. Previously he had been professor of physiological optics and director of the laboratory of physiological optics of the Wilmer Ophthalmological Institute of the Johns Hopkins University School of Medicine. Still earlier he had been for many years professor of experimental psychology and director of the psychological laboratory, Bryn Mawr College.

The retirement is announced of DR. ALBERT H. WALTON, associate professor of psychology at the Pennsylvania State College.

The retirement of DR. CLARK WISSLER, curator of anthropology of the American Museum of Natural History, was announced on July 16.

PAUL BOYNTON, professor of psychology, the George Peabody College for Teachers (Nashville), has been elected president of the Stephen F. Austin State Teachers College (Nacogdoches, Texas).

JACK R. GIBB has been advanced from instructor in psychology to assistant professor at Brigham Young University (Provo, Utah).

DR. W. A. KERR, Purdue University, has been appointed director of personnel research for the RCA Manufacturing Company, Inc., Indianapolis, Indiana.

LOU L. LABRANT, professor of English education, Ohio State University, has been appointed professor of English education at New York University.

A. MERLIN SONES, instructor in psychology, Drexel Institute of Technology, has been appointed assistant to D. L. Stratton, dean of men.

DR. J. EDWARD TODD, formerly professor of educational psychology and director of student relations and personnel at Springfield College (Mass.), has been appointed assistant to Harry F. Lewis, dean of the Institute of Paper Chemistry, Appleton, Wisconsin.

DR. LOUIS P. THORPE of the University of Southern California has been appointed director of the psychological clinic to succeed DR. LEE EDWARD TRAVIS now with the U. S. Army.

WINIFED K. MAGDSICK, of the department of psychology, has been appointed assistant dean, College of Liberal Arts, Washington University, St. Louis.

The University of Wyoming conferred the honorary degree, Doctor of Laws, on DR. JOHN E. ANDERSON, June 8, 1942.

Park College on May 25 conferred the honorary doctorate of science on DR. ROSS A. MCFARLAND, of Harvard University, who gave the commencement address.

CHARLES E. BENSON, chairman of the department of educational psychology, New York University, is on leave of absence for the academic year, 1942-43. BRIAN EARLE TOMLINSON, associate professor of education, will be chairman of an administrative committee to direct the work of the department during Dr. Benson's absence.

At the State University of Iowa, DR. KENNETH W. SPENCE, since the death of DR. JOHN A. MCGEOCH temporary chairman of the department of psychology, has been made chairman; DR. ROBERT R. SEARS, formerly of Yale University, has been appointed Director of the Iowa Child Welfare Research Station to succeed DR. GEORGE D. STODDARD, now New York State Commissioner of Education, who was also dean of the Graduate College. DEAN EMERITUS CARL E. SEASHORE is serving as interim dean of the Graduate College until a successor to Dr. Stoddard is appointed.

The National Research Fellowship Board in the Natural Sciences of the National Research Council has appointed JOSEPH CARL ROBNETT LICKLIDER (Ph.D., psychology, University of Rochester, 1942) to a fellowship for the year 1942-43 to work at Harvard University on the effects of previous acoustic stimulation upon sound localization.

Among the sixty-five awards recently awarded by the Social Science Research Council for the academic year 1942-43, were the following made to psychologists:

Post-Doctoral Research Training Fellows:

ELSE FRANKEL BRUNSWIK, Ph.D., University of Vienna, research associate in psychology, Institute of Child Welfare, University of California, for advanced academic training in sociology and anthropology.

THEODORE R. SARBIN, Ph.D., Ohio State University, research associate in psychology, University of Minnesota, for training in psychiatric methods in social psychology. (Reappointment).

Pre-Doctoral Field Fellows:

JOHN BENTON GILLINGHAM, social psychology, University of Wisconsin, for field training with reference to "white collar" employees in selected industrial organizations.

Grant-In-Aid Appointees:

ROGER G. BARKER, assistant professor of education, University of Illinois, for the completion of an investigation of the effects of severe, long-continued frustration upon behavior.

ROSALIND GOULD, research associate, The Bank Street Schools, New York City, for the completion of an experimental investigation of repression.

ERNEST R. HILGARD, professor of psychology and education, Stanford University, for the completion of a study of the social aspects of housing.

HELEN BLOCK LEWIS, instructor in psychology, Brooklyn College, for the completion of an experimental study of the role of the ego in cooperative and competitive work.

HENRY S. ODBERT, assistant professor of psychology, Dartmouth College, for the completion of an analysis of a word and phrase test.

In June, 1942, the Psychological Corporation announced the establishment of the James McKeen Cattell Grants-in-aid of Research in Applied Psychology. The principal purpose of these grants is to aid to research already under way by increasing the scope of the study or by permitting more intensive analysis of the data. In September the Psychological Corporation announced the award of the James McKeen Cattell Grants-in-aid for the academic year 1942-1943 to HARRY C. STEINMETZ, associate professor of psychology, San Diego State College, San Diego, California; HAROLD H. ANDERSON, associate professor of psychology, University of Illinois, Urbana, Illinois; DELTON C. BEIER, Testing and Guidance Bureau, Louisiana State University, Baton Rouge, Louisiana, and ELEANOR O. MILLER, professor of psychology and chairman of the department, Illinois College, Jacksonville, Illinois.

The Washington-Baltimore Branch of the American Psychological Association held its fourth meeting of the academic year at the University of Maryland, College Park, Maryland, on May 14, 1942.

The program of contributed papers was as follows:

1. Miss DOROTHY ADKINS, Department of Social Security, "Problems of Test Construction in Civil Service Jurisdictions."
2. DR. RENSIS LIKERT, Department of Agriculture, "Psychological Research as a Tool of Democratic Processes."
3. DR. STEWART H. BRITT, The George Washington University, "The Activities of the Office of Psychological Personnel."

The following officers were elected for the coming year: *President:* DR. WENDELL W. CRUZE, Wilson Teachers College. *Vice-President:* DR. J. M. STEPHENS, The Johns Hopkins University. *Secretary:* DR. J. W. MACMILLAN, University of Maryland. *Treasurer:* MRS. MILDRED ST. MARTIN PERCY, District of Columbia Public Schools.

At the Annual Meeting of the American Psychological Association in New York City, September 3, 1942, the Election Committee reported elections as follows: *President*, JOHN E. ANDERSON; *Council of Directors*, SIDNEY L. PRESSEY and ROBERT H. SEASHORE; *Nominess for Representatives on the National Research Council*, JOHN E. ANDERSON, ARTHUR G. BILLS, and HADLEY CANTRIL; *Representative on the Social Science Research Council*, WALTER S. HUNTER.

At its Sixth Annual Meeting Held in New York City on September 4, 1942, the American Association for Applied Psychology announced the elections of LT. COMMANDER C. M. LOUITTIT, USNR as *President*, and of DR. ALICE I. BRYAN, Columbia University, as *Executive Secretary*.

The L. B. Fischer Publishing Corporation of 381 Fourth Avenue, New York, announces the publication of a new series of low priced (\$1.25) pocket-sized books designed to service the student and intelligent reader by dealing authoritatively with varied aspects of modern scientific knowledge. The series is to be known as the Treasury of Science and is under the supervision of a distinguished Board of Editors. It is the publisher's intention to add at least 24 volumes every year. The publishers invite correspondence regarding manuscripts.

Research workers seeking instruments required in their work but difficult to find are invited to communicate with D. H. Killeffer (60 East 42 Street, New York City), chairman of the newly appointed Committee on the Location of New and Rare Instruments of the National Research Council. The plan is to assist in locating needed instruments of types not ordinarily available through usual channels. Assistance is particularly desired from owners and builders of instruments falling within the new or rare categories which might be made available to others through sale or for temporary use under mutually satisfactory conditions.

CORRECTION

In the abstract by OLIVER L. LACEY on page 511 of this volume, the second sentence in the second paragraph which reads "The susceptible animals were higher than normal in blood sugar and red cell concentration, and lower in total protein," should read, "The susceptible animals were lower than normal in blood sugar and red cell concentration, and higher in total protein."

NOTICE

Because of priorities in printing, slowness of mail, and other delays incident to the war effort, it may be somewhat difficult to distribute the *Psychological Bulletin* on the first of the month according to schedule. While every effort will be made to maintain the schedule, subscribers are asked to be patient in the face of the delays that may occur from time to time.

Psychological Bulletin

THE FIRST COURSE IN PSYCHOLOGY

BY DAEL WOLFLE

University of Chicago

The teaching of the elementary course in psychology constitutes one of the most important tasks performed by psychologists. In total, more time is devoted to it than to any other course. For many a student it provides the only contact with the systematic study of human behavior and the best opportunity to gain a more penetrating and objective insight into his own personality.

Discussion of the first course seems to be as interesting as it is important. The teaching of psychology has for some years been one of the most popular and most frequently scheduled topics for symposia at national and regional meetings. At the Stanford meeting of the American Psychological Association a symposium on "The Elementary Course in Psychology" listed 16 speakers and attracted a large audience.

The amount of time and thought that has gone into attempts to improve the elementary course in psychology is undoubtedly very great. A fraction of all this energy has been reported in a series of studies of course objectives, content, and methods of teaching. This paper will serve as a guide to these studies, review the more important ones, and make a number of recommendations regarding the organization and teaching of the first course—recommendations which, it is hoped, will be helpful to the teachers, particularly the beginning teachers, of elementary psychology.

SURVEYS AND GENERAL REPORTS

In 1908 the American Psychological Association appointed a committee, consisting of James R. Angell, Mary Whiton Calkins, Edmund C. Sanford, Guy Montrose Whipple, and Carl E. Seashore, Chairman, which conducted a thorough and extremely interesting investigation of the teaching of the first course in psychology. The committee subdivided its work into several

sections. Whipple (111) surveyed "The teaching of psychology in normal schools." Calkins (10) described "The teaching of elementary psychology in colleges supposed to have no laboratory." Sanford (85) reported on "The teaching of elementary psychology in colleges and universities with laboratories." Angell (2) discussed "Laboratory courses and equipment in psychology for colleges and universities." Seashore (91) prepared a "General report on the teaching of the elementary course in psychology; recommendations." Seashore's report was not a formal summary of the preceding papers, but rather a set of specific recommendations regarding the aim, the method, the place in the curriculum, the equipment, and the teacher which he, and the committee, considered desirable for psychology. This series of reports is still very much worth reading, not only because of its historical interest, but because of the clarity with which some of the problems were discussed. At the same time, these reports make discouraging reading. Now, 30-odd years later, we are still debating many of the same issues and being embarrassed by the same difficulties. Many of the recommendations considered necessary in 1909 are still necessary in 1942.

Since the American Psychological Association committee's report was published, a number of other surveys have appeared. Some years ago the Midwestern Psychological Association and the Southern Society for Philosophy and Psychology appointed a joint committee of 15 members (hereafter called the "Joint Committee") to study the problems of the first course. One report, on course aims, has appeared under Gilliland's name (36). Reports on course content and methods of teaching were promised but have never appeared.

The report of the Southern Society for Philosophy and Psychology Committee on the Teaching of Psychology in the South was prepared by Joseph Peterson (76). A survey of conditions and facilities for the teaching of psychology in the state of Ohio was conducted by Reymert and Arnold (80).

Surveys of the status of, and courses in, psychology have been reported by Henry (47) for liberal arts colleges, Jarrett (53) for state teachers colleges, and Husband (51) for junior colleges. Dallenbach (19) indicates that a new report on psychology in junior colleges will be made in 1942 by a committee of the American Association of Junior Colleges.

Several useful descriptions of the first course as it is taught at a particular university have appeared. Most complete are the

papers by Dockeray and Valentine (24) for The Ohio State University, Longstaff (61) for The University of Minnesota, Schoen (89) for Carnegie Institute of Technology, and Seashore (92) for The State University of Iowa.

COURSE OBJECTIVES

The most important question for the instructor to consider in planning the elementary course is that of the course objectives. He will ordinarily expect to teach a heterogeneous group of students with diverse interests and must plan his objectives accordingly. Just what is appropriate for such a group has never been universally agreed upon. The Joint Committee listed seven aims of the first course. These seven aims, with from three to eight subaims under each, were submitted to 200 instructors in psychology with instructions to rank the three most important ones. The replies of 110 instructors are classified by size of institution and geographical location in Gilliland's paper (36). Dockeray and Valentine (24), Longstaff (61), Schoen (89), and Seashore (92) have described the objectives of the course as it is taught at those authors' institutions. These five lists are the most carefully considered statements of first-course objectives available. Those which appear on two or more of the five lists are included in Table I.

TABLE I
OBJECTIVES OF ELEMENTARY PSYCHOLOGY

	Joint Com- mittee	Dockeray and Valen- tine	Long- staff	Schoen	Sea- shore
1. Teach facts and principles of psychology	x	x	x		x
2. Develop scientific method or habits of critical thought	x	x	x	x	x
3. Provide better ability in making personal adjustments	x	x	x		
4. Prepare students for later courses, or interest them in psychology	x		x		
5. Teach what psychology is and is not, or eliminate popular superstitions		x		x	

1. To teach psychology, its technical vocabulary, its facts, and its principles, was specifically listed as an objective by all five

sources except Schoen, and the outline of the course which he offers makes it obvious that this objective is implicit in his course planning. Regardless of what an author says in his preface about other objectives, it is this aim which dictates most of the content of the usual elementary text. There is probably more nearly universal agreement on this aim than on any other. We may or we may not want to make psychology useful, but we want to teach psychology. We may want to train students in the habits of critical thought, but we want to do it with regard to the facts of psychology and not as a special project.

This objective is properly the first one of the beginning course in psychology. The information presented is a part of the cultural background of an educated man and is basic to the attainment of the other objectives which have been suggested.

2. The second objective is to train students in the scientific method as it applies to the study of human behavior, or to develop in students the critical, open-minded, and objective attitudes which characterize the scientific approach to human problems. This goal was named on each of the five lists summarized in the table, has been stressed by Miner (68), and is stated in the prefaces of a number of elementary texts. It was placed first in importance by a larger number of instructors in Gilliland's (36) survey than was any other objective.

There are really two objectives here which are related but by no means identical. One is to train students in the scientific method as a technique of experimentation which psychologists, like all scientists, have found essential for arriving at general principles of behavior. The other is to make students think critically and objectively about human behavior itself and about statements regarding human behavior which are seen or heard, even though those students may never perform, or even read the original report of, a well-controlled experiment.

To teach elementary students the scientific method as an experimental procedure, as a means of convincing them that psychologists are really scientists, or to teach them the method in the abstract, is not worth while. There is little transfer from the general description to the specific applications. There is also little transfer from the scientific method as taught in the physical (or even in the biological) sciences to the critical, objective, and scientific attitude toward problems of human behavior which many psychologists hope to develop in their students.

Emphasis on the scientific method as a technique of investiga-

tion is necessary and desirable in training experimenters. But it is certainly not necessary and probably not desirable in the elementary course. It is much more to the point to train elementary students to think for themselves about psychological problems than to teach them the logical and experimental steps in a method which most of them will never use. If the elementary course can make students more critical and scientific-minded in their attitudes toward human problems, it will have been of great value.

3. A third objective is to make the elementary course useful to the individual student by developing his ability to understand and to cope with the personal adjustment problems of daily life. In one form or another, this objective has been stated by the Joint Committee (36), Dockeray (22), Dockeray and Valentine (24), Emery (26), Gardner (32), Gaskill (35), Leeper (60), Longstaff (61), McKinney (64), Roberts (82), Rothney (83), Wembridge (110), and by the authors of a number of elementary texts. Calkins (10) and Sanford (85) found this to be one of the stated objectives in college and university courses in their 1909 surveys. Gilliland (36) found it to be one of the most popular aims, particularly in the smaller colleges, in his survey.

The belief that psychology should be made useful in the everyday lives of students results in two different types of elementary psychology courses. In the first type it is held that the subject matter of the course should be so selected and presented that the student will gain a working understanding of motivation, personality, learning, and human dynamics generally. This knowledge, it is hoped, will enable him to understand the conflicts and problems which develop in himself or in his close associates. Perhaps, even, it will help him to prevent or minimize conflicts. A course in psychology designed to achieve this goal has been described by Leeper (60). A related course on personality has been outlined by Gaskill (35).

In the second type, the elementary course would become a project in mental hygiene. This program has been suggested by Gardner (32), Laird (57), McKinney (64), and Rothney (83). McKinney (65) has written a text which would be appropriate for this kind of course.

In contrast, many psychologists are unwilling to list this objective at all. Muenzinger (70) has taken the position that utility should definitely not be a factor in selecting material for the first course. Skaggs (97) doubts if the first course in psychology can ever be made functional in the lives of students, because the sub-

ject is difficult and the average student lacks the ability necessary to master it.

It is obviously impossible to train accomplished psychologists in one course. The teacher recognizes this limitation and should take pains to see that the student also recognizes it. At the same time, many students are not going to take additional work in psychology; if they do not gain any insight into their own or another's personality and problems in the elementary course, they may never do so. To give them some knowledge of why we all do the things we do, to increase, even by a little, their ability to face personal conflict is, personally and socially, one of the most valuable contributions the course can make. Granting that the chances of failure are frequently large, the possibility of some success justifies the effort.

4. To interest students in psychology or to prepare them for later courses in psychology or related fields is offered as one aim of the course by the Joint Committee (36) and by Longstaff (61). It is also considered by Ruch (84) and emphasized by Guilford (42).

How much weight should be given to preparation for later courses depends on a good many specific local factors. If most of the students do take advanced courses in psychology or particular related courses, the preparatory function of the first course may justly be stressed. But if this is the case, greater care than is customary should be taken to integrate the first course with the advanced one so that the elementary course does actually prepare the student for the later one and the later course does actually make use of and build upon that preparation.

In general, it is easy to overemphasize the importance of the preparatory function of the first course. Many students will take no more courses in psychology. Those who do will not all take the same course or courses. For most students, then, it seems better to make the elementary course a unit in itself, to teach it as if none of the students would ever take another course in psychology, and to try, in teaching it, to attain the first three objectives in this list. The actual attainment of these objectives will constitute good preparation for advanced work in psychology while at the same time doing the much more important job of helping to prepare the student for the role of an educated member of society.

5. To distinguish between scientific psychology and psychological quackery is an objective listed by Schoen (89). Unquestionably, the student should finish the course with the ability to make some of these distinctions, but this objective should be

achieved incidentally. If the subject matter of psychology is taught, the students will certainly know what psychology is about. If the students have learned to think critically about human problems, they will see for themselves some of the fallacies involved in the quack psychologies. An instructor who believes that some time can wisely be spent in debunking spiritualism, fortunetelling, or phrenology will find source material in such books as Yates' *Psychological racketeers* (112). The time spent in this effort should, however, be carefully curtailed.

Closely related is the attempt to eliminate popular superstitions and misconceptions regarding human nature, an aim listed by Dockeray and Valentine (24) and one to which attention has been paid for a good many years (Sanford, 85).

It does not seem worth while to spend much class time on this point. If a critical inquiring attitude can really be developed in the student, many of these superstitions should be eliminated more or less automatically. If that attitude cannot be developed, there is little point in trying to eradicate a few specific superstitions.

There is little pertinent experimental evidence. Valentine (107) found that teaching the general principles of the experimental method showed little transfer to specific misconceptions. McGarvey (63) found little transfer from those popular superstitions which were discussed in class to others which were not.

The first three objectives on this list have been more frequently advanced than any of the others. They are also more important than any of the others—so important that the course should concentrate on efforts to attain them. If the others can be attained incidentally, so much the better. If they cannot be, the loss is less important than would be the failure to achieve one of the three major goals.

Not all instructors will agree with the present evaluation of these objectives. Some disagreement is expected. The important point is not that there should be perfect uniformity of objectives, but rather that each instructor should know precisely what his are. To write down the specific changes or benefits which the elementary course is expected to produce is a valuable experience for the instructor and promises a better course for the student.

STUDENT ATTITUDES TOWARDS ELEMENTARY PSYCHOLOGY

Students register for elementary psychology for a wide variety of reasons. Most of these reasons, English (29) found, are vague.

Many of them can never be realized, since the students' notions of what constitutes psychology differ so much from the instructors' ideas of what should be taught. English makes the commendable suggestion that the instructor should emphasize the course objectives and show the student how the material taught serves to achieve these objectives. In this way students will know from the beginning what they are supposed to learn.

Several studies have been conducted at the end of the elementary course to determine student attitudes with regard to the difficulty, value, and interest either of the course as a whole or of its separate parts.

The difficulty of the elementary course in comparison with courses in other departments has been studied by Longstaff (61) and Altman and Hartmann (1). Eighty-seven per cent of Longstaff's students rated psychology as at least equal in difficulty to the average college course. Altman and Hartmann compared psychology grades with average grades in other subjects. On this basis they concluded that psychology was an easy course for premedical students and a hard one for engineering and education students. Dimmick (21) administered Miner's Blank for the Analysis of Work Interests to elementary students and then compared their interests with course grades. The interests of A and B students differed significantly from those of D and E students in several respects. Beaumont (5) found little relation between grades in elementary psychology and chances of taking further courses in the department.

Student ratings of course value have been obtained by several authors. Longstaff (61) found that 91% of 2057 students would insist or recommend that elementary psychology be taken by a younger brother or sister. In comparison with the average college course, 96% of Longstaff's large group rated the course as equally or more provocative of thought, 90% as equally or more valuable for other courses, and 95% as equally or more applicable to everyday life. At the conclusion of the first course, 55% of the students planned to take further courses in psychology. Unfortunately, the elementary course is not always as highly valued as it is at Minnesota; Hill (48) reports some groups of students who find psychology one of the dullest and most uninteresting of their studies.

Arnold (3), Laird (57), Lauer (59), Longstaff (61), and Seward (95) all had students rate a list of psychological topics in terms of value to the student. The five lists of topics differ considerably,

but they do overlap enough to allow a few generalizations. Topics which at least three of these groups considered valuable were: learning, the conscious processes in general, individual differences, and abnormal psychology. Similarly, there was agreement that study of the nervous system and physiological development was of relatively little value.

Student interest in the different topics covered in elementary psychology has been studied by Arnold (3), Hartmann (46), Knox (56), Laird (57), Longstaff (61), Ruch (84), Seward (95), and Tussing (106). No two of these experimenters had the same list of topics rated, but again the topics overlapped enough to show considerable consistency in student attitudes. Topics generally interesting to students are frequently in the personally-practical category. Examples are:

Understanding one's own personality problems (Laird, Ruch, Tussing)

How to improve one's personality (Ruch, Tussing)

Analysis and development of character (Ruch, Seward, Tussing)

Three popular topics which are closer to the academic tradition are:

Heredity and environment (Arnold, Hartmann, Laird, Ruch)

Social psychology (Arnold, Hartmann)

Mental disorders, delinquency, and crime (Arnold, Laird, Ruch, Tussing)

In contrast, some of the most generally uninteresting topics are:

Sensation (Hartmann, Ruch, Seward, Tussing)

Perception (Arnold, Hartmann, Seward)

Animal behavior (Arnold, Laird, Ruch)

Anatomy and physiology of the nervous system (Arnold, Hartmann, Ruch, Seward)

Laird (57), Longstaff (61), Seward (95), and Tussing (106) all report a greater interest in the more practical topics than in the more theoretical ones. Knox (56) found that the members of an adult evening class gave roughly similar rankings to the various topics. Practical topics and unusual topics proved to be more interesting than theoretical and commonplace ones.

The relation between interest and value of different psychological topics has been studied by Arnold (3), Laird (57), Longstaff (61), Ruch (84), and Seward (95). Seward found a correlation of .81 between the two series of ratings; Arnold found one of .60; and Laird, one of .33. Longstaff found that those parts of the course

which were generally considered more interesting were also considered more valuable. Such reports considerable agreement between the topics rated most interesting and those rated most valuable.

The use to be made of student ratings of interest and value in choosing course content will be discussed in the next section.

THE CONTENT OF THE ELEMENTARY COURSE

After the instructor has fixed his objectives he must select that course content which will best serve to attain them. Although the course may in practice frequently be organized without giving explicit attention to its objectives, the content may properly be chosen only with reference to them.

The first objective emphasized above was "to teach psychology, its technical vocabulary, its facts, and its principles." Agreement on what psychology is, from the standpoint of the first course, is not nearly so universal as is agreement on the desirability of teaching it. There are, in fact, no generally accepted criteria for deciding whether or not a given topic belongs in the first course, or for deciding upon its proper emphasis if it is to be included. In the absence of such criteria, individual instructors and textbook writers have tried out a number of bases of selection. Perhaps most important have been the amount known about a topic, student interest, practical worth, tradition, and the instructor's ideas, often unanalyzed, of what is important in psychology. It is not suggested that any instructor has relied on one of these criteria alone. Yet they may be more easily evaluated if they are considered separately.

The amount known about each topic was used by Boring, Langfeld, and Weld (7) as a basis for determining the space allotted to each in their text. This criterion will probably not appeal to most instructors as a sole basis for selecting course content. Some concept of the value of the material in terms of other objectives will usually provide arguments for including or rejecting each possible topic. The criterion must be given some weight, since we can only teach that which we know something about and can perhaps teach best that about which we know most. However, even these authors tempered their criterion in bringing out a revised edition (8) of their book.

Student interest has been used as a basis for selecting course material, but rarely with as frank an admission of that use as Stroud gives in explaining that for his book, "the probable interest

of students has consistently been a determining factor in the selection or rejection of content material. In a few instances certain data have been included from the standpoint of interest, without regard to their systematic necessity" (103, p. vii). The use of student ratings of interest for this purpose is a highly questionable procedure. If it can be demonstrated that these ratings agree closely with the objectives already formulated by psychologists for determining course content, then the ratings may be weighted heavily. But if this agreement exists, the student ratings are unnecessary, for the other criteria are already available for the instructor to use. Actually no very satisfactory criteria are available. Ruch (84) combined the opinions of a number of college authorities as his criterion of value—a criterion which showed substantial agreement with student ratings. On the basis of these findings he selected the material for a text which has been cordially received by most students and many instructors. In contrast, Greene and Osborne (41) found that students' expressions of interest and need proved of little value in organizing a course in educational psychology.

The mere fact that students find a topic interesting is never justification for including it in the course. The following arguments elaborate this position.

Selecting course material to accord with student interest invites the charge that one is "popularizing" the course. By popularizing, the critic usually means cheapening. The instructor who caters to student interest is likely to do one of two things. He may devote too much time to explaining telepathy, demonstrating hypnosis, or discussing other phenomena on the fringe of psychology, or he may tell too many anecdotes and stories which would illustrate some psychological principle if only he had had time to explain that principle. The second danger is that the major emphasis will be given to the more spectacular and "interesting" aspects of applied psychology without regard to the real usefulness of these topics to the student and without adequate background for understanding them. Both of these dangers are exaggerations of perfectly legitimate trends. To have students finish the elementary course better able to discriminate between the substantial body of psychological knowledge and the psychological or pseudo-psychological rackets is a gain both to the student and to society. To have him aware of some of the successful applications of psychology increases his knowledge and is likely to be of benefit to the profession. Both of these trends are legitimate when they are

made to contribute to the real purposes of the course. When either is carried to extremes, the course becomes trivial and no longer deserves college credit.

In considering the proper use to be made of student ratings it is important to note the variability of those ratings. "Motivation," for example, obtained a high interest rating in Ruch's study (84) and a low one in Tussing's (106). "Learning," generally rated high in value, fell into the bottom half of the scale in Longstaff's (61) study and was rated very low in interest by Laird's group (57). Although differences in the topics themselves exist (the abnormal phenomena are more universally interesting than the study of nonsense syllables), the above data suggest, and it is almost certainly true, that the student reaction to a topic depends in part, perhaps in large part, on the manner in which that topic is presented to him.

It may be argued that students learn best what they are most interested in, and this argument may be used to justify the inclusion of interesting topics. It may just as well be used to motivate the instructor to make interesting those topics deemed desirable on other grounds. Where an instructor believes a given topic valuable, the knowledge that his students find it uninteresting should not cause him to drop the topic from the course. That knowledge may better serve to motivate him to improve his handling of the particular topic.

Thus the teacher has the opportunity of selecting topics, and deciding upon the time and emphasis to be given to each, in terms of their appropriateness for the course objectives which have been previously determined.¹ Having done this, he may then choose

¹ There is one field which students usually consider both uninteresting and unimportant and which deserves special attention—the anatomical and physiological description of the nervous system and sense organs. In these attitudes the students are supported by some of their teachers. Long ago Whipple (111) suggested that too much time was devoted to the nervous system. At the same time Seashore (91) recommended that we teach psychology, not sense physiology. More recently Schoen (89) has contended that too much attention to the structure of the nervous system and the sense organs is a frequent fault of the beginning course. Skinner (99) has vigorously supported the argument that psychology as a whole will advance more rapidly by studying behavior and forgetting about the nervous system.

Where most students and some eminent teachers agree that a topic is unimportant, it should be carefully scrutinized. If we actually used the facts of anatomy and physiology of the nervous system as explanations of overt behavior in our elementary teaching, a good case could be made for retaining them. In reality, their use at this stage is very limited. Why, then, should we retain them? Cer-

illustrations and mode of presentation on the basis of student interest. Following such a procedure he would use human rather than animal data to illustrate the principles of motivation, and some of his examples of the processes of learning would be drawn from educational or applied fields instead of all of them being taken from the laboratory studies. Some such program as this is probably nearly always followed, but it is better to make the program definite and deliberate than to fall into it accidentally.

The supposed practical value of a topic is a tempting criterion to use in selecting course material and a justifiable criterion for some advanced courses and for courses given to specialized groups such as nurses or prospective teachers. To select materials because of their industrial, commercial, or professional usefulness, as Tiffin, Knight, and Josey (105) have done, is not so easily justified in a book offered for use in the ordinary introductory course. Since the students in such a course are going to find themselves entering a wide variety of trades and professions, the attempt to teach specific psychotechnological methods will waste a good deal of time. The elementary course may benefit all students more by training them to analyze, and by improving their ability to solve, their own daily-life problems. But this is no longer psychotechnology.

The many elementary texts constitute one of the most easily available sources for the beginning instructor to use in deciding upon the content of his course. In addition, outlines of carefully worked out courses have been published by Dashiell (20), Dockeray (23), Dockeray and Valentine (24), Leeper (60), Longstaff (61), Schoen (89), and Seashore (92). Dockeray (23) and Dockeray and Valentine (24) have made available a list of specific psychological principles or generalizations which are taught in the beginning course at The Ohio State University. Even though none of these course outlines is wholly acceptable to another instructor (or to their authors now), they provide an excellent starting point for organizing a course. Papers by Crawford (16) and Haggerty (45) also contain some useful suggestions.

The selection of course material appropriate for the second and third recommended objectives (to develop a critical objective attitude toward psychological phenomena and to develop the

tainly tradition is not enough to justify us in continuing to teach a diluted, and sometimes obsolete, neural and sensory anatomy. The time devoted to this field in the reviewer's own course is just long enough to refer interested students to the appropriate texts in elementary physiology and neurology.

ability to understand and cope with the personal adjustment problems of daily life) offers somewhat different problems. The first objective required the selection of appropriate course content; the second and third require, in addition, special methods of instruction. There is little available in this field, but some useful suggestions have appeared.

After the task of teaching students to think critically and objectively about psychological problems has been analyzed, it is necessary to find those teaching devices which will serve most effectively to develop the desired mental habits. The most useful paper here is that by Schwab (90). Noll's discussion (71, 72) will be an aid, and some suggestions may be gained from the works of Cox (14) and Katona (55) on the teaching and learning of general principles. The "thought questions" prepared for the General Introductory Course in the Biological Sciences at the University of Chicago (13) will provide a number of concrete illustrations of materials used in developing the students' ability to think critically about related biological problems.

Suggestions for making the course personally useful in the student's daily life may be gained from a number of texts and workbooks. Those by Janney (52), Leeper (60), McKinney (65), Pressey, Janney, and Kuhlen (78), and Ruch (84) merit particular attention. Each section of Leeper's text is introduced by an orienting statement concerning the nature and role of the topic to be considered (e.g. how to deal with others in ordinary social contacts, motivational frustrations, and the different kinds of reactions to them). Following this introduction is a list of references with citations of specific parts or chapters to be read and a brief explanation of each. The references are mainly from such standard works as Young's *The motivation of behavior*, Guthrie's *The psychology of learning*, and Shaffer's *The psychology of adjustment*, but also include a good many books that are quite outside of the textbook class—for example, Marjorie Greenbie's *The arts of leisure*. Each chapter is concluded with a set of specific projects for independent work. These projects include both systematizations or discussions of the readings, and analyses of everyday social situations. One example of this type is:

Analyze the behavior-pattern that is honored by the group in which you are now trying to establish yourself. Work out, as well as you can, the reasons why this is the pattern of behavior dictated by that group (60, p. 13).

The 10 topics covered in this way constitute the first half of a

year's work. For the second half the more traditional texts and methods are employed.

Thus Leeper has tried, in the second half-year's work, to achieve the first objective of the elementary course—to teach the main facts and principles of psychology. Unless deliberate attention is given to the problem, courses emphasizing personality and mental hygiene invite the criticism that they are not teaching psychology.

COURSE ORGANIZATION AND METHODS OF TEACHING

The elementary course in psychology is usually taught in one of three ways. In some institutions all students meet together for every class period for lectures given either by one man or by several members of the department. In other institutions the students meet in large lecture sessions for most of the class periods but once or twice a week the group is divided into small discussion or quiz sections which are usually taught by the junior members of the staff. In still other institutions the class is divided into small discussion groups, each of which is taught by the same instructor every day.

As a further variable, some schools offer elementary laboratory instruction either as a required portion of the introductory course or as an elective supplement to it.

Several psychologists have been interested in comparing the effectiveness of these different methods of instruction, not only in introductory courses in psychology, but in the beginning courses in other fields as well. Since the work on class organization and teaching methods for college courses generally has been recently reviewed by Luella Cole (12), the present summary will be limited to the chief studies of classes in psychology. The results of these studies are in general agreement with those from other fields and with Cole's summary.

Longstaff (61) and Remmers (79) have obtained similar results in comparing the effectiveness of the all-lecture and the lecture-quiz methods of instruction. Longstaff concluded:

There is a trend for the control (lecture-quiz) group to be slightly superior to the experimental (lecture) group but this trend is not large, is only moderately consistent, and can have no practical bearing on the question at issue.

From the above findings we may conclude that under the conditions surrounding this experiment there is no difference in the value of the methods employed (61, p. 48).

Remmers (79) and Spence (102) have compared the lecture method with the discussion method. Remmers found that students in the large lecture groups learned a little more and remembered it a little better than did those in the small recitation sections. The differences were too small to be statistically significant or practically important. Spence reports similar results from a study of classes in educational psychology.

Remmers (79) compared the lecture-quiz and the small discussion section techniques. Again the differences were insignificant.

Of related interest are the studies on class size with method of teaching (lecture) constant. Holland's findings (49) agree with those reviewed by Cole (12)—class size is unimportant.

A project course was developed by Seashore (92) at the University of Iowa to introduce the student to scientific methodology and to acquaint him with the work of the best psychologists more effectively than does the usual lecture course with readings from one or two texts. The course consisted primarily of supervised individual study, conferences with the instructor, and writing of reports on eight projects which made up the course content. Each project was expected to require about one month to complete. In addition to the individual work, demonstrations and lectures on special topics were given occasionally. The course is outlined in detail and enthusiastically recommended in Seashore's paper.

Scheidemann (86) reported no significant differences between average final examination scores of Iowa students taught under this method and those taught by the usual lecture-discussion method.

Of related interest are studies by Crow (17) and Greene (40). Crow reported that in a class in educational psychology, confining the study of texts to the class period seemed somewhat better than assigning study outside of, and in addition to, the class hour. Greene compared the effectiveness of different methods of learning of four topics which he presented as lectures to one group and as material to be read to a matched group. He found little difference between the average scores of the two groups, but reported that the lecture system had tended to bring both the best and the poorest students in toward the class average. If this result is general, lecturing is advantageous for the poorer students, while individual study is better for the good ones. Some weeks later the lecture group remembered the material better than did the reading group. Differences in amount of note taking and review were not controlled. A supplementary point was Greene's finding that the good

students were more confident of their knowledge after reading than after listening to a lecture. These findings indicate that Scheidemann's method of testing (86) may not have done justice to Seashore's project course.

All of the studies on class size and methods of instruction may still be summarized by Longstaff's statement of 10 years ago:

The experimental evidence submitted to the present time tends to support the general conclusion that there is little difference in student achievement in large and small classes and, also, that it makes little difference as to what method of presentation of the materials of the course is used (61, p. 33).²

Despite these findings, a number of schools insist on dividing the elementary class either into completely independent sections or, once or twice each week, into small quiz groups. They may be right, even though they can present no evidence to justify their procedure. The results cited above have been based on examinations covering primarily the factual material of the course. There remains the possibility that other goals than information are achieved to a greater extent in small discussion classes, or in classes taught by other special techniques, than in large lecture groups. Adequate means of measuring the hoped-for, but as yet undemonstrated, benefits of small classes must be developed before this hypothesis can be tested.

Whether the elementary course should include laboratory work is a problem which has worried many psychology departments. Henry's (47) analysis of the catalogues of 157 colleges and universities showed that laboratory work was required in 16.6% of the elementary courses and offered as a parallel elective in another 59.2%. Although laboratory work is usually not required, many instructors think it should be. Dashiell (20), Dockeray (22), Edwards (25), Miller (67), Miner (68), and, I suppose, everyone who has written an elementary laboratory manual, believes that laboratory training strengthens the elementary course. Skaggs (97) even expresses the hope that the American Psychological Association will recommend "that no scientific credit be given in psychology unless the laboratory work accompanies the textbook course."

Farnsworth (31), Laird (58), and Shirley and Hevner (96) agree

² About the only statistically significant difference found in studies of teaching methods is Gaskill's (34) discovery that his students learned more when they listened to him over the radio than when they sat in the broadcasting studio with him.

that allowing the student to work on self-selected individual projects (at least for the latter part of the course) maintains student interest at a higher level than does the usual set of assigned experiments. Miner (68) has substituted a 20-minute written quiz at the end of each experiment for the traditional laboratory report. By this means and by omitting the consistently uninteresting experiments, he attained an increase in enrollment in the laboratory course.

Skepticism regarding the value of the elementary laboratory has been expressed by several writers. Seashore (91, 93) recommends class demonstrations and observations to be made individually by the student, but does not recommend the use of laboratory experiments as part of the beginning course. One of Sanford's anonymous correspondents wrote:

I am of the opinion that a General Introductory Course that is required should not be a laboratory course. Too little can be covered in such a course and to my mind the advantages of the laboratory method should, under the circumstances, be sacrificed for the sake of the greater advantages of a course of wider scope, and such as can be given in the same time in lectures supplemented by copious demonstrations (85, pp. 62-63).

The reviewer is of the same opinion.

In trying to give laboratory work many of the smaller schools are hampered by a lack of apparatus, and many schools, regardless of size, find difficulty in securing enough duplicate pieces to enable all of the members of a class to work at the same time on the same problem. The attempt to overcome the apparatus handicap by assigning experiments which can be done with paper and pencil or with such apparatus as can be constructed out of milk-bottle tops and spools (88) can certainly not be expected to show the student how the psychologist works in gathering his data. Even where there is enough expensive apparatus to please the most exacting, it is to be questioned whether an hour (or at most two hours) spent in getting acquainted with the apparatus and working on a carefully prearranged problem teaches the student anything important that could not be taught more effectively and less expensively by lecture, classroom demonstration, or motion picture.

Even the old defense of the elementary laboratory, that physics and chemistry were taught as laboratory courses, is no longer very useful. The success which survey courses in the biological and physical sciences have had seems to show that the laboratory is not a necessary part of any general course (9, 12).

The sectioning of students according to ability—advice which Seashore (93) gave—has been tried out at a number of schools. The most careful comparison of sectioned and unsectioned classes, by Longstaff (61), found only insignificant differences, but they consistently favored the students taught in a large heterogeneous group. Furthermore, the students preferred heterogeneous to homogeneous groups. Dockeray (22) suggests that better bases for sectioning and more adequate methods of teaching each ability level are necessary before we decide whether sectioning on the basis of ability is advantageous or not.

A few reports concerning examinations in elementary psychology have appeared. Scheidemann (87) notes that students prefer frequent examinations. Smeltzer (100) found that they sometimes aid in learning.

Despite all the time that individual instructors have put into preparing examinations over the course in elementary psychology, few of them have been published. Bathurst and Scheidemann (4) have made one premature attempt to prepare a standardized examination over the course. It appears that the Committee on the Preparation of Examination Questions in Psychology of the American Psychological Association is about to make another (30). Valentine and Wenrick (109) have reported on the validity of tests designed to measure the ability to apply psychological principles, the ability to read graphs, and the achievement of other objectives of the beginning course at The Ohio State University. Smeltzer (101) describes a technique for measuring the student's ability to apply information by comparing his judgments regarding proper procedures in practical situations with the modal judgments of a group of experts. Marsh (62) has described a standard form for grading laboratory reports. Paterson (74) described an attempt to build up a file of examination items from which appropriate ones could be selected whenever a new examination was needed, a procedure which Cole (12) recommends highly. The scoring machine developed by the International Business Machines Company and the techniques described by Cuff (18), Peterson and Peterson (75), and Pressey (77) may be used to facilitate the scoring of examinations.

Most of the published examinations have been offered as accompaniments of specific texts. They are primarily of the true-false or best-answer variety and cover single chapters, the entire text, or both. In general they seem not to have had any more careful scrutiny and criticism before publication than the usual course

examination has before administration. As a group they place too much stress on memory for isolated factual details.

The experience of the Board of Examinations at the University of Chicago has shown that instructors improve rapidly and greatly in ability to write examinations once their work is subjected to expert criticism and their attention focused more sharply on the aims of the examination. The instructor who is interested in improving his own examinations will find worth-while suggestions in Cole's book (12). Illustrations of a number of types of objective items with some useful pointers on item writing are made in the *Manual of examination methods* (81) prepared by the Board of Examinations at the University of Chicago. Both sources illustrate forms which are capable of eliciting much more than the simple factual memory which is the sole essential for answering many objective examinations.

It has been pointed out earlier that the results of various studies, such as those of class size, might have been different had examinations been available for measuring the achievement of some of the so-called intangible aims of the course. For examining aims other than course content, suggestions can be gained from a careful study of some of the examinations and reports prepared by the evaluation staff of the Progressive Education Association's eight-year study of secondary schools, and from Cole (12), Noll (73), Smeltzer (101), and the *Manual of examination methods* (81).

The proper placement of elementary psychology in the school program has been briefly discussed by several authors. Skaggs (98) has suggested that very elementary courses should be offered in high school and even in grade school. Moore (69) has discussed work in psychology at the junior high school level. Gilliland (38) found that freshmen do approximately as well as sophomores in elementary psychology courses at the University of Indiana and at Northwestern University. He quotes a similar finding from the University of Washington. Gilliland (37) also found that students who had had zoology did slightly better in beginning psychology than those who had not.

The total amount of work published on the mechanics of teaching the elementary course in psychology is so meager that in many cases the instructor will gain more from study of what has been done in other fields. For this purpose, Cole's recent book, *The background for college teaching* (12), is an excellent guide. Two general papers by Haggerty (44) and Hollis (50) also contain valuable suggestions.

SUPPLEMENTARY MATERIAL FOR THE
TEACHING OF PSYCHOLOGY

The most important supplement to the teacher's efforts is the textbook. In 1910 Seashore (91) wrote: "All teachers who cannot find good text books should at once publish their own!" Seashore's advice has been taken by so many psychologists that one recent author began his text with the apology: "We possess a number of good texts for the first course in psychology. There is really no excuse for adding another one to the list unless one has a special reason. My special reason . . ." (70). In total, more than 50 elementary texts (not including those directed to such special groups as nurses) were published in the decade of the 30's.

A comparison of these texts is made whenever the instructor chooses one of them for class use. Haggerty (45) has constructed a check list of topics which might be used in evaluating and comparing texts. In 1927 Meyer (66) wrote a general summary and criticism of nine (at that time) recent texts. In 1939 and 1941 Emme (27, 28) rated each of 20 recent texts in terms of five criteria (scholarship of the author, teachability, etc.) and then assigned rank orders to the texts on the basis of the combined ratings. The report of the Committee on the Preparation of Examination Questions in Psychology of the American Psychological Association reported that in 1941 the five most frequently used texts were, with the number of adoptions reported to the Committee, those by Ruch, 70; Woodworth, 68; Dashiell, 49; Guilford, 16; and Boring, Langfeld, and Weld, 14.

Emme (27, 28) also classified the chapters in each of the 20 texts according to subject matter. I have had these tables extended to include most of the texts published during the years 1930-1941. Classifying the content by chapters does not show as great differences between the texts of the earlier and later parts of this period as the advertising and prefaces of some of the more recent texts would lead one to expect. The most marked trends brought out were:

1. A slight decrease in the amount of space devoted to study of the foundations of human behavior.
2. A slight increase in the amount of space devoted to social issues and applied psychology.
3. A greater increase in the amount of space devoted to personality patterns, mental hygiene, and adjustment.
4. An increased frequency of texts written by several authors in collaboration.

5. An increase in the number of pictures and drawings included.
6. An increase in the number of pages.
7. An improvement in the format of most texts.

As further aids for the teacher, the authors of a number of recent texts have published accompanying workbooks, which include review exercises, class and individual experiments, topics for discussion, and suggested observations.

Condensations of research studies or reviews of the experimental work in selected fields have been published by Garrett (33) Valentine (108), Crafts, Schneirla, Robinson, and Gilbert (15), Guilford (43), and R. H. Seashore (94). The two latter books consist of general summaries in which each field is covered by a separate author. These volumes enable the student to get closer to the original sources than he can with the usual textbook, without requiring an extensive library of journals for that contact.

A carefully annotated list of instructional films appropriate for courses in psychology has been compiled by Beck (6). Carlson (11) and Gleason (39) recommend the use of strip film and a projector as an aid in showing graphs and charts and in conducting some class experiments. Thurstone (104) has described this technique in greater detail and has used it for testing groups of subjects.

RECOMMENDATIONS

The following statements do not constitute a formal summary of the studies reviewed above. They are, rather, personal recommendations—recommendations based on those studies and on experience with the elementary course in a number of different universities. In the preceding pages will be found the arguments, and such evidence as exists, to support the statements which are here made quite dogmatically.

1. The first task of the beginning instructor of elementary psychology, and, indeed, of any instructor who has not already done it, is to write out specifically the objectives of his course—the changes which he expects to develop in, and the benefits which he expects to be gained by, the students.

2. Three major objectives seem to deserve most emphasis:

The first is to acquaint the student with the most important and most generally accepted facts, principles, and hypotheses of psychology. The attainment of this objective will contribute to

the student's general cultural education and will increase his ability to recognize and to deal intelligently with the psychological problems of modern society.

The second objective to be stressed is to develop the habit of critical and objective analysis of psychological problems which arise and of the data or hypotheses available to help solve them.

The third important objective depends upon the attainment of the first two and consists of the improvement of the student's ability to understand his own personal problems and to achieve personally and socially desirable solutions of those problems.

3. The three objectives stated above are in very general terms. Before they can be realized they must be analyzed in detail and specific steps toward their attainment decided upon.

4. The specific bits of information and practice in the specific skills desired constitute the course content. Material which does not aid in the attainment of these subgoals has no place in the course.

5. Studies of student interest should not determine the course content. As long as no better criteria of effectiveness are available, such studies may properly serve as guides in selecting the best type of illustration or the best method of treating a topic. Used in this way, student interest ratings may improve the course without popularizing or cheapening it.

6. Laboratory instruction is not a necessary part of the elementary course and is not required in most colleges.

7. Much more work is necessary to develop adequate means of measuring the extent to which the several objectives of the course are really achieved. Present examination techniques are best suited to the measurement of the student's knowledge of vocabulary, facts, and principles. Methods are also available, but are less adequate and still less frequently used, for the measurement of ability to apply those facts and principles and for the measurement of the ability to think critically about human problems and data.

8. Until it is possible to get reliable measures of the extent to which each of the course objectives is attained, it is impossible to give complete answers to questions concerning the relative merits of different teaching methods. Such data as now exist indicate that large classes are as effective as small ones and that the lecture is as effective as the class discussion in teaching the facts and principles of psychology.

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PROCEEDINGS OF THE FIFTIETH ANNUAL MEET-
ING OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION, INC. NEW YORK CITY,
SEPTEMBER 3, 1942

REPORT OF THE SECRETARY, WILLARD C. OLSON,
UNIVERSITY OF MICHIGAN

Comprehensive plans for a program of scientific sessions and for celebrations of the Fiftieth Anniversary of the Association and the Centenary of the birth of William James were developed for Boston and Cambridge with members of the Psychology Department of Harvard University as hosts (*Psychological Bulletin*, July 1942).

The plans were cancelled by vote of Council in cooperation with the Office of Defense Transportation and the following notice issued to all voting Members:

Ann Arbor, Michigan
August 1, 1942

SUBJECT: Notice of Annual Meeting

To Members:

Plans for the Annual Meeting, Celebrations, and Scientific Program at Boston and Cambridge have been cancelled in cooperation with a request from the Office of Defense Transportation.

The Council of Directors is calling an Annual Meeting to be held at the Hotel Pennsylvania in New York City at 1:30 P.M. on Thursday, September 3, 1942. The intent is that this meeting will be attended by members of Council, chairmen of committees, representatives, such Members as are resident in the New York area, and others whose participation would not make for additional strains on the transportation system. Such "skeletonized" meetings of organizations having activities connected with the war effort are in conformity with the request from O.D.T.

The objects of the meetings are:

1. In general, to transact all items of business which may properly come before an Annual Meeting and are not enumerated specifically here.
2. To elect Associates and Members.
3. To receive and act upon reports of committees and representatives of the Association.
4. To amend the By-Laws to provide for interim and emergency powers for Council and to consider and act upon such other changes as may be recommended by the Committee on the Constitution.
5. To make appropriations for the continuation and possible extension of the services of the Office of Psychological Personnel.
6. To approve the annual budget.
7. To consider and authorize new publications.

8. To raise the dues, if necessary, for additional services to psychologists in connection with war and civilian activities.

To know the will of the Association, to provide for the contingency that a quorum may not be present at New York, and to prepare for future emergencies, Council requests your vote on the following resolution:

Resolved that for the duration of the war, or until the government rescind its request that scientific societies suspend their meetings, the requirement of an annual meeting of the Association be suspended; and that the Council of Directors be given full authority to transact the business of, and act for, the Association, provided that all actions taken be recorded and made available to Members of the Association and that the opinion of the Association be obtained by an advisory mail ballot whenever possible, and provided further that this motion be understood not to delegate to the Council power to alter the procedure prescribed for the election of officers as set forth in Article VI of the By-Laws.

The enclosed penny postal also seeks information on the likelihood of your presence at the meeting and your proxy in case of necessity. It is hoped that Members in New York and environs will turn out in force. Your prompt reply is solicited and suggestions will be gratefully received.

Cordially,

WILLARD C. OLSON, *Secretary*

The postcard poll was conducted in order to instruct the meeting and to provide for the contingency that further restrictions might prevent a quorum from being present. The poll was closed at noon on Saturday, August 29, 1942. By that time 393 or 54% of the total of Members had replied.

Of those replying, 98 planned to attend the meeting, 9 were undecided and 282 did not plan to attend. Four failed to answer this question. Since the constitutional requirement for a quorum is 50, a quorum seemed assured, and the assurance was borne out by subsequent events.

Of those replying, 374 or 95% approved the resolution in the Call increasing the interim emergency powers of Council. Nine disapproved and ten failed to reply.

Members were asked to give proxies for the Secretary to vote in accordance with the recommendations of the Council of Directors in case a quorum should not be present. Three hundred and forty-six gave their proxies, ten withheld them, and thirty-seven omitted the response. Some of the omitted and withheld proxies were, of course, accounted for by persons who expected to attend the meeting.

The Council of Directors of the American Psychological Asso-

ciation met on September 1 and 2 preceding the Annual Business Meeting. The Board of Governors of the American Association for Applied Psychology met on September 2 and 3 with the Annual Business Meeting on the morning of September 4. At this meeting Lieutenant Commander C. M. Louttit, U.S.N.R., was elected President and Dr. Alice I. Bryan was named Executive Secretary. The A.A.A.P. voted to appropriate \$1000 toward the support of the Office of Psychological Personnel. The Emergency Committee in Psychology of the National Research Council met on September 1 and 2. The Society for the Psychological Study of Social Issues met in Washington on September 5 and 6.

The total of 150 persons who registered included one Life Member, 89 Members, 46 Associates, 2 newly transferred Members, 3 newly elected Associates, and 9 non-members.

In order to conserve transportation, persons at a distance were discouraged from attending the meeting except as they were officers or had other business in the neighborhood. An analysis of the registration reflects the success of the plan: California, 2; Connecticut, 8; Delaware, 1; Washington, D. C., 7; Florida, 3; Illinois, 3; Indiana, 1; Louisiana, 1; Maryland, 2; Massachusetts, 9; Michigan, 2; Minnesota, 1; New Jersey, 12; New York, 80; Ohio, 5; Pennsylvania, 7; Rhode Island, 1; Tennessee, 1; Virginia, 3; England, 1.

TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

Due notice having been given the Annual Business Meeting of the American Psychological Association, Incorporated was held on September 3, 1942, in Parlor 1, in the Hotel Pennsylvania in New York City. A quorum being present the meeting was called to order at 1:30 P.M. by President Calvin P. Stone.

Upon motion by the Secretary, duly seconded, it was voted that the Minutes of the Forty-ninth Annual Meeting held at Northwestern University be approved as printed in the November, 1941, issue of the *Psychological Bulletin*.

The assembly stood in silent tribute as the Secretary read the names of the following Members and Associates who had died: Members—Raymond Dodge, April 8, 1942; Clarence E. Feree, July 26, 1942; Kurt Koffka, November 23, 1941; John McGeoch, March 3, 1942; Wilbur H. Norcross, June 11, 1941; Earl Bennett South, May 31, 1941; J. Leroy Stockton, January 5, 1942; F. J. E. Woodbridge, June 1, 1940: Associates—Harry M. Capps, January 17, 1942; Margaret T. Davidson, February 14, 1941; Margaret J.

Drake, September 20, 1941; Willis D. Ellis, July 21, 1942; C. Prescott Lecky, May 30, 1941; Elizabeth A. Walsh, April 15, 1940.

The Secretary announced the resignation of the following four Members: Helen P. Caldwell, Karl C. Garrison, Keith Sward and George R. Wells.

The Secretary announced the resignation of the following 61 Associates:

Arnold, Henry J.	Kerr, Jean Adelaide
Barton, William A.	Kerry, Mrs. John R.
Bayne, Thomas L., Jr.	Laushall, Edward
Beasley, W. C.	Lockhart, Earl G.
Berkowitz, Bernard	Lough, J. E.
Bumatay, Elias F.	Milliken, Alma (Mrs. Roesner)
Cann, Sarah Dunlap	Neff, Walter S.
Carroll, Robert P.	Newcomb, Helen M.
Carter, Thomas M.	Owings, W. A.
Cornsweet, Albert C.	Poindexter, Ruth W.
Crawford, Madeline	Pugh, Eunice A.
Croft, Anita	Pyle, Charles B.
Dorsch, Sr. M. Verda	Roeder, W. S.
Dove, Claude C.	Rosenstein, J. L.
Eads, Laura K.	Rudisill, Earl S.
Falls, James David	Russell, J. T.
Feurt, Osta B.	Saetveit, Joseph Gerhard
Ford, Charles A.	Sanders, Barkev S.
Frank, Benjamin	Schiller, Belle
Friedlander, Joseph W.	Seiler, Mrs. C. Linn
Gardner, Helen	Silverman, Simon S.
Gardner, Herbert Noble	Silvey, Clel T.
Harvey, Nathan A.	Skolnick, Alec
Highsmith, J.A.	Stout, H. G.
Hogan, Virginia	Stroop, J. Ridley
Hoppock, Robert	Thompson, Lorin A.
Horowitz, John	Tierman, John J.
Hovde, Howard T.	Von Tacky, Janet L.
Huebner, Dorothy (Mrs. Fertig)	White, Goodrich C.
Jennings, Florence	Wright, Barbara H.
Johnston, Margaret	

The Secretary announced the cancellation of the election of the three following persons who were elected at the 1941 meeting but who did not meet the subsequent requirements: William R. Crooks, Ilse Forest, Thomas E. Malone. Richard Q. Bell, elected at the same meeting, did not qualify since he joined the armed forces and notices were returned "address undisclosed."

The Secretary announced that Howard D. Marsh had applied for and received the status of Life Member.

The Secretary announced that the Council of Directors had approved the actions of President Stone in making the following appointments:

H. P. Weld of Cornell University as delegate to the inauguration of Henry Elisha Allen as President of Keuka College on November 7, 1941.

Robert A. Brotemarkle of the University of Pennsylvania and Dr. Daniel Katz of Princeton University to serve as delegates to the Annual Meeting of the American Academy of Political and Social Science in Philadelphia on April 10 and 11, 1942.

Helen Peak of Randolph-Macon Woman's College as delegate to the 100th Anniversary of the founding of Hollins College, May 17-19, 1942.

John M. McGinnis of Hollins College to act as representative as the Centennial Celebration of Roanoke College on May 29-31, 1942.

A. T. Poffenberger of Columbia University to act as representative at the inauguration of Harry Noble Wright as President of the City College of the College of the City of New York on September 30, 1942.

The Secretary reported:

That congratulatory telegrams had been sent as follows: To James McKeen Cattell and the Psychological Corporation on the occasion of the celebration of the Twentieth Anniversary on November 28, 1941; to the Inaugural Committee, Montana State University on the inauguration of Ernest Oscar Melby as President on December 8, 1941.

That the secretary applied on January 23, 1942 for exemption from the Michigan Sales Tax on the Yearbook and other publications of the Association and that the exemption was granted by Louis M. Nims, Commissioner of the Department of Revenue in a letter dated February 3, 1942.

That a letter had been sent to affiliated and non-affiliated societies listed in the Yearbook suggesting that each name an unofficial representative to attend the 1942 Annual Meeting and to report back to the local and regional societies.

The Secretary announced the following interim actions of Officers of the Association:

The sixth joint meeting of the Council of Directors and the Board of Editors was held on Wednesday, September 2 at which time reports on editorial and business policies were discussed.

A joint meeting of the Council of Directors and the Emergency Committee in Psychology was held on Wednesday, September 2, for a discussion of the relation of psychologists to the war effort and the support of the Office of Psychological Personnel.

John E. Anderson was elected as Editor of the Psychological Bulletin by the Electoral Board for a six-year term to succeed the late John A. McGeoch.

Clarence R. Carpenter was named Chairman of the Committee on Motion Pictures and Sound Recording Devices in Instruction of Psychology to succeed Adelbert Ford, resigned.

President Stone, as instructed by the Association at the 1941 meeting, appointed the following Members to the Committee on Publicity and Public Relations: Robert H. Seashore, Chairman; Robert G. Bernreuter, E. R. Guthrie, and John A. McGeoch (since deceased)

The Secretary read the following letter from Mr. McCarthy of the Office of Defense Transportation:

Mr. Willard C. Olson
c/o University of Michigan
Ann Arbor, Michigan
DEAR MR. OLSON:

This will acknowledge and thank you for your letter of August 12th concerning the plan of the American Psychological Association to reduce the size of their September meeting.

We are appreciative of the spirit of cooperation indicated in this change of plans and believe the general reaction to your announcement will be most favorable. Voluntary contributions, such as that made by your Association, will do much to avoid the necessity of a definite order, and it is hoped the response will be sufficient to make any such action unnecessary.

Yours very truly, (Signed)
H. F. MCCARTHY, *Director*
Division of Traffic Movement

Gregory Razran announced from the floor that he had received a letter from Professor A. R. Luria who is directing a clinic in the Ural Mountains for the rehabilitation of the brain injured in the war. Dr. Luria reports that he and his colleagues are very much in need of certain reprints from American psychologists and neuropathologists. Dr. Razran offered to forward such materials if sent him at Department of Psychology, Queens College, Flushing, New York.

Leonard Carmichael in the absence of Herbert Woodrow, Chairman of the Election Committee, announced the election of the following officers by mail ballot:

President for 1942-1943: John E. Anderson, University of Minnesota

Council of Directors for 1942-1945: Sidney L. Pressey, Ohio State University and Robert H. Seashore, Northwestern University

Nominees for Representatives to the Division of Anthropology and Psychology of the National Research Council: John E. Anderson, University of Minnesota; Arthur G. Bills, University of Cincinnati; and Hadley Cantril, Princeton University

Representative on the Social Science Research Council: Walter S. Hunter, Brown University

Following the announcements the President took up in order the items on the mimeographed list of recommendations of the Council of Directors. These were presented as motions already made and seconded and open for discussion.

The Association voted to elect the following five persons directly as Members: A. S. Barr, Charlotte B. Buehler, Gustav Ichheiser, Herschel T. Manuel and Franklin C. Paschal.

The Association voted to transfer the sixty-two Associates named below to status of Members:

Amen, Elizabeth Wheeler	Koch, Adolph Meyer
Beck, Lester F	Laslett, Herbert Reynolds
Beck, Samuel Jacob	Long, Louis
Bedell, Ralph Clairon	McGinnis, John Marshall
Bennett, George Kettner	McTeer, Wilson
Boder, David Pablo	Mead, Leonard Chapin
Campbell, Albert Angus	Mikesell, Henry William
Casanova, Teobaldo	Moore, Joseph Ernest
Champney, Horace	Mosher, Raymond Mylar
Courts, Frederick A.	Rapaport, David
Cruikshank, Ruth Marjoire	Ratliff, Margaret MacLeod
Davidson, Helen P.	Riess, Bernard Frank
Dimmick, Graham Bennett	Rodnick, Eliot H.
DuBois, Philip Hunter	Rothney, John Watson Murray
Dulsky, Stanley G.	Seashore, Harold Gustav
Edwards, Allen L.	Seidenfeld, Morton Alfred
Estes, Stanley Goddard	Strongin, Edward Isreal
Finan, John Lincoln	Taylor, Harold Claire
Finch, Frank H.	Taylor, Howard Rice
Galt, William Egleston	Thornton, George Russell
Gilhousen, Howard Clarke	Thorpe, Louis Peter
Gilmer, B. von Haller	Tolman, Ruth Sherman
Hallowell, Dorothy Kern	Volkman, John
Harriman, Philip Lawrence	Walton, Albert
Harrower-Erickson, Mary Rachel	Welch, Livingston
Haven, Seth Edson	Wenger, Marion Augustus
Heiser, Karl Florian	Willits, John Metts
Held, Omar Conrad	Wilson, Douglas James
Jastak, Joseph	Wrenn, C. Gilbert
Jeffress, Lloyd Alexander	Wulfbeck, Wallace Howard
Keller, Fred Simmons	Weinland, James D.

The Association voted to elect as Associates the 329 persons whose names appear below:

Abelson, Harold Herbert	Aikin, Mary M.
Agoa, John J.	Altman, Charlotte Hall

- Angyal, Alice Fellner
Arnheim, Rudolf
Arnold, Magda B.
Arsenian, John
Artley, A. Sterl
Babcock, Lyndon Ross
Bach, George Robert
Back, Kurt Wolfgang
Backstrom, Oscar, Jr.
Ball, Fred J.
Barrett, Irving Abner
Basch, Marian Caroline
Beck, Hubert Park
Beckman, Edith
Berman, Reuben E.
Bice, Raymond C.
Bintz, Miriam
Birch, Herbert George
Birren, James E.
Bitterman, Morton Edward
Blackwell, Harold Richard
Block, Virginia Lee
Blos, Peter
Blum, Gerald Saul
Bone, Harry
Bonney, Merl Edwin
Borkow, George K.
Börnstein, Walter S.
Borow, Henry
Bown, Max Duane
Boyle, Joseph A.
Brecher, Sylvia
Brown, Kenneth B.
Brown, William H.
Brozek, Josef M.
Buck, John Nelson
Buckingham, Guy Emerson
Bugental, James Frederick
Burgess, Mark
Burr, Samuel Engle
Byrne, Martin John
Calvert, Wallace A.
Carpenter, Edwin Kenneth
Carper, Doris Viola
Carrison, Doris B.
Casner, Daniel
Chaplin, James P.
Chotica, John William
Clark, Kenneth Bancroft
Cleveland, Earle A.
Cleveland, Sidney Earl
Coffey, Walter Calvin, Jr.
Cohen, Lucien Alvin
Cohler, Milton
Coleman, Paul Evans
Collins, Charles W.
Cope, Alfred B.
Corbin, Horace Harlan
Cornehlisen, John Henry, Jr.
Corsini, Raymond
Czurles, Stanley A.
Danish, Tamaara, Jr.
Davis, Richmond H.
de Cillis, Olga E.
DeCoursey, Charles J., Jr.
De Grazia, Sebastian
De Groat, Charles Henry
De Koker, Mary
Devlin, William J.
Dunham, Charles Vernon
Dunlap, James Milne
Dunn, Georgia Nobis
Dunn, Michael Butler
Endacott, John Lawrence
Evans, Mary Catharine
Evans, Mary Catherine
Fagin, Harold Theodore
Faubion, Richard William
Feifel, Herman
Feldman, Helene
Felsenburg, Gertrud
Fischer, Liselotte K.
Fiske, Marjorie E.
Flynn, Bernard Mary
Fox, Richard E.
Foxworth, Sarah Payne
Fry, Martha Ohlson
Fuchs, Edmund F.
Garber, William Frank
Gaylord, Richard Hilliard
Gibson, Jerome Hines
Gilbert, Harry Bernard
Gliedman, Lester H.
Goldstein, Nathan
Goldsmith, Johanna Ruth
Goodrich, Leroy Ashbel, Jr.
Gordon, Mordecai H.
Granick, Samuel
Grant, Vernon Wesley
Grassi, Joseph Ralph

- Graver, Harold A.
 Grauer, David
 Greco, Marshall Charles
 Greene, Ronald R.
 Griffiths, William J.
 Gustav, Alice
 Haagen, Conrad H.
 Halliday, Robert Wayne
 Harms, Irene E.
 Harris, Esther Kite
 Harris, Thomas M.
 Hart, Olive M.
 Henderson, Margaret
 Herbert, Marvin James
 Herma, John L.
 Higbee, Ruth V.
 Hill, Harris Ernest
 Hollander, Leonard
 Holmes, Frank James
 Holodnak, Helen B.
 Holway, Amy Richardson
 Horn, Daniel
 Hovey, Henry Birnst
 Hsia, Yun
 Hunter, Robert B.
 Jaques, Elliot L.
 Jenkins, Mildred E.
 Jerome, Edward A.
 Johnson, Albert P.
 Johnson, Allison Heartz
 Johnson, Beatrice R.
 Johnson, Ernest P.
 Johnson, Florence May
 Johnson, Virginia H.
 Johnson, Walter Irvin, Jr.
 Joseph, Brother Boniface
 Judge, James Philip
 Kallman, Franz J.
 Karlowski, Thornton C.
 Katz, William D.
 Kay, Lillian Wald
 Kellogg, E. Ruth
 Kemper, Hollis D.
 Kendler, Howard H.
 Kennelly, Thomas W.
 Kestenbergl, Rachel D.
 Kieffer, Sherman N.
 Kirby, Theresa K.
 Kirk, Marquis A.
 Kirkner, Frank J.
 Kogan, Leonard Saul
 Kosseff, Jerome Williams
 Kramer, Harold
 Kremer, Alphonse
 Kriegman, Lois S.
 Kroop, Esther
 Kuenne, Margaret R.
 Ladieu, Gloria
 Landrith, Barbara
 Lane, Ruth Crow
 Lamoreaux, R. Ross
 Lassner, Rudolf
 Laudenslager, John McKinney
 Laurier, Blaise Viger
 Lebeaux, Thelma E.
 Lemmon, William Burton
 Lennon, Lawrence Joseph
 Levi, Joseph
 Levi, Verna
 Levinger, Leah
 Levinson, Daniel Jacob
 Lewin, Ludwig
 Lipkin, Stanley
 Long, Hazel Lee
 Loudenslager, Ellen Whaley
 Löwi, Moritz
 Lum, Vernon Hung Kwong
 Lush, Dorothy Eleanor
 Lynn, John Galloway
 Mack, Ruth G.
 MacMinn, Paul
 MacNaughton, John Frederick
 Malamud, Harold Ronald
 Malcom, Edward V.
 Margulies, Helen
 Marx, Melvin Herman
 Maurice, Ruth Catherine
 Mausner, Howard
 Mayer, Ruth Jeanne
 McCord, Fletcher
 McEwen, Noble Ralph
 McKeever, Benjamin
 McManama, Sister Maurice
 McNally, Harold J.
 Meadow, Arnold
 Meadows, John L.
 Mensh, Ivan Norman
 Miller, George Armitage
 Miller, Gladys Grace
 Milton, Emmette Ohmer, Jr.

- Mintz, Sidney
Moriarty, Francis Matthew
Morse, William Charles
Mosel, James Norman
Moser, George C.
Mueller, Conrad George, Jr.
Myers, C. Maxwell
Neasmith, Jean Louise
Nettler, Gwynne
Nicolayson, Edward
Nielsen, Otto Richard
Nordahl, Norris G.
Norin, Mary Anne
Oexle, Helen M.
Orr, Sister M. St. Mary
Osborne, R. Travis
Osgood, Stanley Ward
Ottillie, Marvin J.
Pederson, Ruth A.
Pepinsky, Harold
Perkins, Charles Callahan, Jr.
Peterson, Donald Arthur
Pettit, Jack O.
Phelan, Sister Mary Benedict
Phillips, Ewing Lakin
Piatt, Donald Ayers
Picard, Robert
Polmantier, Paul Churchill
Pomeroy, Donald Silas
Pomeroy, Wardell Baxter
Price, Mary Alice
Prichard, Mary Elinor
Pritchard, Miriam C.
Prothro, Edwin Terry
Raley, Sister Agnes Lucile
Raskin, Nathaniel J.
Redl, Fritz
Reinitz, Arthur Henry
Reppert, Harold Curtis
Ricciuti, Edward A.
Ricciuti, Henry N.
Richmond, Pearl Miller
Ritchie, Benbow Ferguson
Robinson, Eleanor Louise
Roe, Anne
Rome, Helen Ewart
Roos, Mary Mae
Ross, Mary Eleanor
Ross, Sherman
Rowe, Dorothy
Ruesch, Jurgen
Rusmore, Jay Theodore
Russell, Ned Miller
Sacks, Jerome Gerald
Sands, Harry
Saupe, Mildred Winn
Savage, Beatrice M.
Schiffer, Jerome
Schlesinger, Otto L.
Schmidt, Hermann Otto
Schneiders, Alexander
Schoellkopf, Judith Abbott
Schuler, Edgar Albert
Schwade, Edward David
Schwartz, Stanley S.
Shapiro, Stewart Bennett
Shatin, Leo
Shulman, Edward Eli
Sickles, William Russell
Siegel, Herbert
Siegel, Miriam G.
Simpson, James Elliott
Smith, Kendon Rasey
Solomon, Elizabeth Ann
Speicher, Joseph L.
Sperling, Philip I.
Spitz, Rene A.
Sprol, Samuel Joseph
Stauffer, George Emil
Stein, Saul
Steinmetz, Harry Charles
Stellar, Eliot
Stevenson, Iris
Stolurow, Lawrence M.
Sweeney, Mary Agnes
Symonds, Johnnie Pirkle
Tasch, Ruth Jacobson
Thiesen, John Warren
Thompson, George C.
Thompson, Merrell E.
Thompson, William Richard
Tiedeman, David Valentine
Tilton, John Philip
Trout, Elinor
Truscott, Ida P.
Tucker, Ledyard R.
Twitchell, Vernon Bronson
Ullman, Albert Daniel
Valentine, John Ashby, Jr.
van Saun, Horace Richard

Volkman, Florence S.
 Waldfogel, Samuel
 Wallace, Wimburn Leroy
 Wallen, John Louis
 Watson, Gladys Hipple
 Weibel, Frances Marie
 Werner, Kathryn Elizabeth
 Wexler, Samuel
 White, Marian Louise
 Wiener, Daniel Norman
 Wiesander, Margaret
 Wilder, Carlton Edwards
 Williamson, Margaret Ogilvie

Williams, J. Robert
 Wilson, John Todd
 Wilson, Margaret Boyd
 Winn, Ralph B.
 Wolf, Katherine M.
 Wunderlich, Henry
 Wylie, Ruth Carol
 Yaffe, Silvia Fishbein
 Yarrow, Leon Jay
 Yudin, Harry Charles
 Zander, Alvin Frederick
 Zwerling, Israel

Upon recommendation of the Council of Directors the Association voted:

That the report of the Program Committee, Elmer Culler, Chairman, be accepted with thanks and ordered printed in the Proceedings. The Association further voted that the new Committee consist of Harold Burtt, Chairman, Dael Wolfe and the Secretary. (See Reports.)

That the report of the Committee on Precautions in Animal Experimentation, Norman R. F. Maier, Chairman, be accepted with thanks and ordered printed in the Proceedings. The Association further voted that Robert C. Tryon of the University of California be made chairman, and that W. J. Brogden be made a member of the Committee for the term 1942-1945. (See Reports.)

That the report of the Committee on Motion Pictures and Sound Recording Devices in Instruction of Psychology, C. R. Carpenter, Chairman, be accepted with thanks and ordered printed in the Proceedings, and that the Committee be continued with its present membership. (See Reports.)

That the report of the Committee on the Preparation of Examination Questions in Psychology, Edward B. Greene, Chairman, be accepted with thanks and ordered printed in the Proceedings, and that the Committee be continued with the following members: Edward B. Greene, Chairman, Charles Bird, Paul R. Farnsworth, Richard W. Husband, Leon A. Pennington. The Association further voted that an additional \$300 be appropriated for the activities of the Committee. (See Reports.)

That the report of the Advisory Committee on the *Psychological Index*, A. T. Poffenberger, Chairman, be accepted, ordered printed in the Proceedings, and that the Committee be discontinued with the thanks of the Association for its accomplishments. (See Reports.)

That the report of the Committee on Displaced Foreign Psychologists, Barbara S. Burks, Chairman, be accepted with thanks, ordered printed in the Proceedings, that the unexpended balance of the appropriation for 1942 be continued for 1943, and that the Committee be requested to turn over its functions as rapidly as practicable to the Office of Psychological Personnel. (See Reports.)

That the report of the Committee on Investments, Willard L. Valentine, Chairman, be accepted with thanks, ordered printed in the Proceedings.

ings, and that the Committee be continued with its present membership. (See Reports.)

That the report of the Committee on Scientific and Professional Ethics, Edward C. Tolman, Chairman, be acknowledged and the Committee commended for its handling of the problems referred to it for adjustment. The Association further voted to appoint John F. Dashiell as chairman and to appoint Gordon Allport to replace E. C. Tolman whose term expires.

That the report of the Committee on the Constitution, John F. Dashiell, Chairman, be accepted with thanks, and that the Committee be continued.

The Association next proceeded to ballot on the following constitutional changes based upon the Committee's report. Each was adopted unanimously:

That Article XI, Section 2.e., be altered by changing the phrase following the last comma to read: "grouped or marked to indicate those who are Members and Associates of the American Psychological Association."

That Article X, Section 6 be altered by deleting all of sentence 3, which reads: "The expiration dates of . . . and 'Psychological Review,' 1947."

That Article X, Section 6, be altered by adding at the end the following sentence: "In the case of the death, disability, or resignation of any editor and pending the election of the new editor, the Board of Editors through its Chairman shall be responsible for the editorial conduct of the journal concerned."

That Article III, Section 4, be altered by inserting in the third sentence the words "of members of the Association's committees and," making that sentence read: "In the interval between annual elections, the Council of Directors shall have the power to fill vacancies created by the death, disability, or resignation of members of the Association's committees and of elected representatives to other organizations."

That Article III, Section 4, be altered by inserting after the next-to-the-last sentence and before the last sentence the following:

"In the interval between annual meetings the Council of Directors shall have authority over the affairs of the Association and shall take such actions as are necessary for the conduct of the Association, except that no action shall be taken which is contrary to an action taken by the Association at its annual meeting or which is inconsistent with these By-Laws. If an emergency arises between annual meetings, the Council of Directors shall have the power to change plans for meetings, to expend such funds, and to take such other actions in the name of the Association as it may deem necessary and wise, provided however, that no action shall be taken under this emergency clause until an affirmative vote of three-fourths of the members of the Council declaring that an emergency exists be secured and provided that all actions so taken be recorded and made available to the membership at the next succeeding Business Meeting of the Association and that all financial transactions shall pass through

the Treasurer's office and be recorded and audited in accordance with these By-Laws, and provided further that nothing in this section be understood to delegate to the Council power to alter the procedure prescribed in these By-Laws for the election of officers. When possible, before declaring that an emergency exists the Council of Directors shall seek an expression of opinion by mail from the ballot circulated to Members at their latest recorded addresses. In connection with any interim or emergency action, the Council of Directors may secure the opinion of the Members or of the Members and Associates by mail.

Upon recommendation of Council the Association voted:

That the progress report of the Committee on New Publications, Joy Paul Guilford, Chairman, be accepted with thanks and the Committee discharged.

That the report of the Committee on Observance of the Fiftieth Anniversary of the American Psychological Association and the Centennial of William James, Edwin G. Boring, Chairman, be accepted with thanks, and that the Committee be continued and encouraged to prepare the Commemorative Number of the Psychological Review. The Association further voted an appropriation of \$25 for special expenses and that copies be made available to Associates and Members at a special prepublication price to be determined.

That the report of the Committee on Refugee Children, created jointly with the A.A.A.P. under the Chairmanship of Arthur T. Jersild be acknowledged with thanks, that the Committee be discontinued under its present title, and reconstituted with the same membership as the Committee on War Services to Children.

That the progress report of the Committee on Standardization of Measures of Electrical Skin Resistance, G. L. Freeman, Chairman, be acknowledged with thanks and the Committee continued.

That the report of its representatives to the American Association for the Advancement of Science be accepted with thanks and ordered printed in the Proceedings, and that Edmund S. Conklin and A. T. Poffenberger be elected as representatives. (See Reports.)

That the report of its representative, H. B. English, on the Council of Human Relations of the American Association for the Advancement of Science be accepted with thanks, printed in the Proceedings, and that Dr. English be continued as representative. (See Reports.)

That the report of Steuart H. Britt, the Association's representative in the American Documentation Institute be accepted with thanks and ordered printed in the Proceedings, and that Dr. Britt be reelected as representative. (See Reports.)

That the progress report of Harold O. Gulliksen as a representative of the American Psychological Association to the American Standards Association be accepted with thanks and that Dr. Gulliksen be continued as representative.

That the report of the delegates to the Inter-Society Color Council be accepted with thanks and ordered printed in the Proceedings, and that affiliation with the Inter-Society Council for 1942-1943 be continued.

Council further recommends that the present delegation be continued with its chairman, Forrest Lee Dimmick. (See Reports.)

That the report of Leonard Carmichael, a representative of the American Psychological Association to the National Research Council, be accepted with thanks and ordered printed in the Proceedings after editing to eliminate confidential material. (See Reports.)

That the report of Mark A. May, a representative to the Social Science Research Council, be accepted with thanks and ordered printed in the Proceedings. (See Reports.)

That Leonard Carmichael be continued as representative on the National Committee on Education and Defense.

That Associate Membership in the American Council on Education be continued at \$10 a year.

That the report of the Committee on Psychology and the Public Service, Dr. L. J. O'Rourke, Chairman, be accepted with thanks, ordered printed in the Proceedings, and that the Committee be continued with the addition of S. H. Britt for Walter Miles, resigned. (See Reports.)

That a Committee on the Curriculum in Psychology for the Preparation of Students for War Service be created to cooperate with the Committee on College Curriculum Adjustments of the United States Office of Education and that the Committee be appointed by the incoming president.

The Association voted further:

That the report of the Committee on Extension of Functions of the Secretary's office, Herbert Woodrow, Chairman, be accepted with thanks, ordered printed in the Proceedings, and that the Committee be continued. Council further recommends that the unexpended balance of the appropriation for 1942 be withdrawn and a new appropriation of \$250.00 be made for the year 1943. (See Reports.)

To ratify the following resolution of Council passed in February, 1942, and published in the *Psychological Bulletin* in April, 1942, appropriating \$4,000 for the support of an Office of Psychological Personnel:

WHEREAS the Nation finds itself in a grave emergency requiring the efficient utilization of available man power; WHEREAS psychologists in increasing numbers are bringing their special training to bear on the conduct of the war; WHEREAS the several services and various institutions are facing serious shortages or dislocations; WHEREAS Associates and Members of the American Psychological Association have indicated unequivocally by a poll and actions at the Annual Meeting their desire for extended services in their behalf; and WHEREAS a formal request for such extension has been received from the Emergency Committee in Psychology of the National Research Council;

BE IT RESOLVED: (1) that the Association take steps immediately to establish an Office of Psychological Personnel to be concerned with the maximum, effective use of psychologists, irrespective of society membership, in the war effort; (2) that the Council exercise its powers to extend the functions of the Secretary's office by the appointment of an Assistant Secretary to be known also as the Executive Director of the Office of Psychological Personnel; (3) that Council appropriate at once the sum

of four thousand dollars (\$4,000) for the part-time salary of the Executive Director, secretarial assistance, and operating expenses for the period of February 1, 1942, to October 1, 1942; (4) that the continuation of the office, its relation to the Secretary's office, and its continued support be reviewed at the next Annual Meeting of the Association; (5) that the Chairman of the Division of Anthropology and Psychology be requested to make the necessary arrangements, if possible, for the location of the office in the headquarters of the National Research Council in Washington or to make other suitable arrangements that will obviate the payment of rent; (6) that foundation assistance in the support of the office be welcomed if obtainable; and (7) that the Treasurer be authorized to draw drafts on any available funds of the Association for the purposes specified above.

Signed,

Council of Directors

ELMER A. CULLER

HORACE B. ENGLISH

JOY B. GUILFORD

EDWIN R. GUTHRIE

EDNA HEIDBREDER

ERNEST R. HILGARD

CALVIN P. STONE, *President*

WILLARD L. VALENTINE, *Treasurer*

WILLARD C. OLSON, *Secretary*

To ratify the action of Council of August 5, 1942 appropriating an additional \$2,250 for continuing the support of the Office of Psychological Personnel on an enlarged basis for the balance of the fiscal year of 1942.

That the Association appropriate \$10,000 for the support of the Office of Psychological Personnel to be expended by the Treasurer according to a budget to be approved by Council and that an additional sum of \$2,680 be appropriated to be used, if, in the judgment of the Council of Directors such additional expenditures should prove desirable.

That \$2.00 be assessed on Members and Associates to assist in financing the War efforts of Psychologists through the Office of Psychological Personnel.

That the Association join with other national associations of psychologists in a convention of American psychologists to discuss the problems of the national organization of psychologists; that the Association direct the Council of Directors to nominate a list of eighteen nominees; and direct the Election Committee to hold an election within two months for obtaining five delegates with alternates, said election to be by preferential mail ballot; that the delegates be directed to meet at the call of the Emergency Committee in Psychology with the delegates of the other societies to prepare proposals to be reported back to the Association at its next Meeting.

That Joseph Zubin, appointed by Council as representative to the Division of Personnel of the National Committee for Mental Hygiene, be made a representative of the Association.

That the Association recommend to the Emergency Committee in

Psychology that the Secretary be made a consultant to the Office of Psychological Personnel.

That it favored negotiations for the purchase of the *Journal of Applied Psychology* through the Council of Directors and the Business Manager of Publications.

That the report of the Treasurer and Business Manager of Publications, W. L. Valentine, for the year ending December 31, 1941, be approved and ordered printed in the Proceedings. The report is supplemented by a report of the auditors. (See Reports.)

That Section 2, Article VIII of the Constitution be amended to substitute "an appropriate adjustment toward . . ." for the phrase "\$4.75 against."

That the Treasurer's budget for 1943 be approved and ordered printed in the Proceedings. (See Reports.)

That Willard Valentine be reelected as Treasurer of the Association for a five year term.

That the next Annual Meeting be scheduled tentatively for Thursday, September 2, 1943 at Chicago, it being understood that it will be a skeleton meeting unless restrictions on travel are raised, that Council may change the plan by a declaration of emergency or by the exercise of interim powers, and that Council be authorized to name a local member of the Executive Committee.

Upon motion by Professor Walter R. Miles, duly seconded, the Association adopted the following resolution of thanks:

Be it resolved that the American Psychological Association, assembled at the Fiftieth Annual Meeting, expresses its thanks to the Management of the Hotel Pennsylvania for the facilities placed at its disposal for this meeting, and that it expresses its cordial appreciation to the psychologists of Harvard University for their preliminary work in planning an Annual Meeting for Boston and Cambridge.

There being no further business, the meeting adjourned at 4:30 P.M.

REPORTS

REPORT OF THE PROGRAM COMMITTEE

To the Council of Directors and Members of the American Psychological Association:

In response to the Call for Papers, which was issued in conjunction with the Preliminary Announcement of the Executive Committee, 158 abstracts were received directly from the membership. This was smaller than the number (184) received last year for the Evanston meeting and still smaller than the number (228) received in 1940 for the Pennsylvania State meeting. In addition, seven approved abstracts were submitted on behalf of the Psychometric Society for a section on Psychometrics and seven by the Society for the Psychological Study of Social Issues for a section on American Public Opinion Today. Of the 172 abstracts, 154

were accepted (two subsequently withdrawn) and distributed into 21 section meetings as compared with 182 in 1941 and 190 in 1940. In addition, the Program Committees of American Association for Applied Psychology planned a series of professional meetings for August 30, 31, and September 1.

In its report a year ago, the 1941 Program Committee published in summary form the replies to a questionnaire which was designed to ascertain the will of the membership concerning future scientific programs of our Association. From these returns, certain policies were formulated which the present committee has tried, so far as practicable, to incorporate in the plans of this meeting. Some features of the 1942 program may briefly be noted:

1. Inasmuch as the year 1942 is the Centenary of the birth of William James and also the Semicentenary of the American Psychological Association, appropriate addresses and exercises for each event were scheduled for the evenings of September second and third, respectively. Both of these celebrations were organized with great care by the Committee on Celebrations, under the chairmanship of E. G. Boring. The annual business meeting, which was thus displaced from its usual position in the program, was set for 3:30 Thursday afternoon.

2. A *general session* was reserved for Wednesday forenoon, the opening day, at which four invited speakers (Henry A. Murray, John C. Whitehorn, Curt P. Richter, Herbert H. Jasper) were scheduled to address the Association on topics of general psychological interest.

3. In response to widespread demand, two panels on Psychology and the War were scheduled under the chairmanship of Leonard Carmichael and Karl M. Dallenbach, respectively. A panel discussion on Psychophysiological Approaches to the Problems of Mental Disorder was organized by Knight Dunlap, at the Committee's request. Five additional roundtables were listed at the request of individuals and groups.

4. A scientific session of the National Institute of Psychology was arranged for Wednesday afternoon. The topic of the meeting was Recent Advances in Motivation, with special addresses by E. C. Tolman and R. R. Sears.

5. A local committee in Boston and Cambridge, under the chairmanship of Dr. J. Garton Needham, was charged with the responsibility of previewing and listing motion-picture films. Five films were approved for exhibition on Wednesday afternoon and again on Friday afternoon.

6. Original plans envisaged a section-meeting on Latin-American Psychology, under the chairmanship of J. G. Beebe-Center. Inasmuch as very few Latin-American representatives could have attended, a roundtable was eventually substituted for the section.

The Program, as thus projected, was printed in the July, 1942 issue of the *Psychological Bulletin*. Even though all scientific sessions were cancelled in deference to a request from the federal Office of Defense Transportation, Council voted to publish the prepared program as a permanent record of the "state of Psychology" in 1942. Our Committee believes that the present program is, in structure and content, one of the most promising in recent years, and regrets the necessity which enforced its abandonment. What the future holds, we do not venture to predict;

but we assume that no formal programs will be issued until existing travel-restrictions have been lifted.

Respectfully submitted,
WILLARD C. OLSON
HAROLD E. BURTT
ELMER CULLER, *Chairman*

REPORT OF THE COMMITTEE ON PRECAUTIONS IN ANIMAL EXPERIMENTATION

To the Council of Directors and Members of the American Psychological Association:

No infractions of the rules of the Association have been brought to the attention of this Committee this year. As far as the Committee is aware there has been neither attempted state legislative action nor a press campaign designed to restrict animal experimentation.

The Committee wishes to call attention to interested psychologists that copies of the printed rules and precautions concerning animal experimentation are available and will be sent to any laboratory on request.

Respectfully submitted,
W. N. KELLOGG
R. C. TRYON
N. R. F. MAIER, *Chairman*

REPORT OF THE COMMITTEE ON MOTION PICTURES AND SOUND RECORDING DEVICES IN INSTRUCTION OF PSYCHOLOGY

To the Council of Directors and Members of the American Psychological Association:

The demands of war have disorganized this Committee. The elected Chairman, Dr. Adelbert Ford, has been working with the Navy and Dr. Kenneth Baker has been in Washington. The late appointment of the present chairman and the cancellation of the annual meeting have further disrupted the work of this Committee.

The Committee made a study of opinion of its members early in the year regarding the question of how to improve the program of moving pictures for the annual meetings of the Association. The Committee approved more rigorous selection of films for general interest programs. It held that films should be previewed by a Committee of the Association and selected and classified. The Committee felt that research films should be short, not more than one hundred fifty feet, and shown, as is done with lantern slides, along with the research report or paper. Members of the Committee in general favored the following plans: repeat showings of excellent films during the meetings; provide facilities so that research workers can show their films to selected, interested groups; provide opportunities for previewing by small groups of outstanding films from whatever sources which are found useful in instruction in psychology. There was general agreement that the length of a moving-picture program should not exceed two hours and that it should be planned with as much unity and cohesion as possible.

This Committee has a number of important problems and questions under consideration. These may be stated briefly as follows:

- (1) What can be done to evaluate in an effective and helpful manner psychological films which are available?
- (2) What should be done to facilitate distribution of good moving pictures and other audio-visual aids materials?
- (3) Is it desirable for the Association to establish a moving-picture project patterned after that recently set up at the Wistar Institute?
- (4) Is it possible to collect a library of slides and other illustrative material which could be readily and cheaply duplicated and distributed?
- (5) How can recently developed sound recording and reproducing devices be adapted for use in the instruction of psychology?
- (6) What can be done to record by moving pictures the work being done by psychologists in connection with the war?
- (7) Is it within the province of this Committee to sponsor the more effective use of radio in psychological instruction?

It is the hope that this Committee may become better organized for more effective work during the coming year.

Respectfully submitted,

KENNETH H. BAKER

ADELBERT FORD

MILTON METFESSEL

WILLARD L. VALENTINE

C. R. CARPENTER, *Chairman*

REPORT ON THE COMMITTEE ON THE PREPARATION OF EXAMINATION QUESTIONS IN PSYCHOLOGY

To the Council of Directors and Members of the American Psychological Association:

The Committee voted early in the year 1942 by a mail ballot to assemble a pool of test items applicable to the elementary course in psychology and an attempt to prepare samples of items which would be made available only to instructors in elementary courses.

In response to postal cards sent to persons who had previously shown their willingness to contribute items, approximately 30,000 items were obtained. Approximately 3,000 of these were selected by the chairman of the committee in the hope of securing (a) the best items available, (b) sizeable samples of items in each of the major topics of the course, and (c) good examples of various types of items.

Packages of these items were mailed to various persons who had agreed to evaluate them for ambiguity together with instructions for marking each item. To date approximately one-half of the items have been returned marked by one or more editors. Of these marked items approximately one-half have been rated as unusable because of ambiguity. There was a tendency to eliminate the more complex items and to thus reduce the content of the examination to the simplest statements of definition or fact. It is believed that many of the items could be made acceptable by a competent editor. It is hoped that each item shall be approved by at least

five qualified individuals before being included in any materials which may be issued by the committee.

Inspection of the items has shown that approximately ninety per cent may be classed as rote-memory items involving bits of information about a subject. The committee desires that more items should be secured involving *problems* or *inferences*, inasmuch as the technique of problem solving is considered one of the major objectives of the elementary course. The committee feels strongly that this work should be forwarded because (a) the quality of items submitted indicates a serious need for improvement of examination techniques, (b) well-prepared items would furnish a basis for careful study of both instructional methods and student accomplishment at various institutions, (c) nearly one hundred requests have been received from instructors of psychology for sample items, and (d) the preparation of a carefully selected and classified set of items would supplement the work of the Committee on the Titles and Content of Courses in Psychology.

It is therefore recommended (a) that further efforts be made to rate the items, (b) that the committee be granted five hundred dollars for next year (\$350 for a part-time technical editor to revise important items and \$150 for supplies, postage, and printing), (c) that a short manual of test item construction and validation be prepared to accompany any sample items which may be issued.

Respectfully submitted,

PAUL R. FARNSWORTH

RICHARD HUSBAND

CHARLES BIRD

L. A. PENNINGTON

EDWARD B. GREENE, *Chairman*

REPORT OF ADVISORY COMMITTEE ON PSYCHOLOGICAL INDEX

To the Council of Directors and Members of the American Psychological Association:

The *Psychological Index* Project carried on with the support of W.P.A. and for which your Advisory Committee was appointed was suspended on June 30, 1941, as stated in the report of last year. This action followed the decision of the Government to eliminate all "white collar" projects from the W.P.A. program. Although every effort was made to save the project, including a special mission to Washington to confer with the authorities there, it has been necessary to recognize that changing conditions would and should make cessation of all W.P.A. programs inevitable.

Your chairman, the technical director of the work, obtained custody of all the material and Columbia University generously provided storage space for it. Adequate cases for storing the records were provided through funds obtained by the chairman.

In the autumn of 1941, information was received from a reliable source that the project would probably be reopened with the direct support of the Federal Government rather than indirectly via New York City. The director was advised to present a complete and detailed proposal with this

new support in view. Such a proposal was prepared by Mr. H. C. Brown, the former supervisor of the project. Its 160 pages give a complete history of the undertaking with exhibits showing every step in the process. This excellent report will make it possible to reinstate the whole program whenever it may become feasible to do so. Although the prospects for its reopening in the autumn with federal support were good, the events beginning on December 7, 1941 changed the whole picture. The chairman and all those who have served with him in the work look forward to the time when means may be found for completing it.

Two tangible minor by-products have come from the project to date. They are "The Psychological Index Abstract References" in two volumes prepared by Dr. Heinz Ansbacher, and all but 40 copies of which have been disposed of; and the "Abstracts of Aviation Psychology" indexed, edited and typed by the Psychological Index staff, at the request of the Civil Aeronautics Administration of the U. S. Department of Commerce.

In the present state of world affairs, the chairman is impelled to ask for the discharge of the Committee. In the name of the whole staff of the W.P.A. project he expresses appreciation for the support given by the Council of Directors and the Association.

Respectfully submitted,

K. M. DALLENBACH

C. M. LOUTTIT

R. R. WILLOUGHBY

A. T. POFFENBERGER, *Chairman*

REPORT OF THE COMMITTEE ON DISPLACED FOREIGN PSYCHOLOGISTS
To the Council of Directors and Members of the American Psychological Association:

With only a handful of refugee psychologists arriving in the almost prohibitive year of 1941-42, the work of the Committee has been lighter than in the three previous years. There are still displaced psychologists who are striving desperately to get here, but closed frontiers and exorbitant transportation costs from Lisbon have largely stemmed their emigration. Even correspondence with some of them stopped abruptly after Pearl Harbor; letters sent in the autumn of 1941 from New York have come back during the summer with the ominous rubber-stamp legend, "Return to sender, service suspended."

An International Seminar in Psychology was continued at Harvard University, and was integrated with the Defense Seminar Project. Temporary job-placements have been found for about eight of the emigres in touch with the Committee, and scholarships for several others. Correspondence has been conducted with about fifty, and several dozen have been assisted by personal interviews, introductions, collaboration on manuscripts, securing of library privileges, and in other ways. "Vocational guidance" for emigres who have been in this country for a year or more has come to be a prominent activity of the Committee. There is now a considerable crop of foreign psychologists who have had internships or volunteer jobs for a long enough period to gain a working knowledge of

the American scene and some familiarity with American psychology. Some of these psychologists have found jobs related to the war effort, or have successfully (though temporarily) replaced American psychologists called into service. But some of them have unrealistic ideas as to possible "next steps," and we have tried to be of assistance in getting these matters objectified.

It may be expected that personnel services undertaken during the year by the American Psychological Association and the Eastern Psychological Association will absorb some of the work previously done by the Committee, particularly in the case of emigre psychologists who have been in this country for several years. There will probably be need, however, for another year or more, of a centralized Committee to keep on hand the *curricula vitae* of emigres, to answer inquiries from emigres and employers, and to continue the informal vocational orientation which personal interviews permit. We recommend that the Committee be continued with its present membership.

We recommend that no appropriation be made by the A.P.A. for the coming year, but request that the balance from the past appropriation be left to the credit of the Committee to be drawn upon for secretarial help and office supplies as needed.

Respectfully submitted,
GORDON W. ALLPORT
WILLIAM A. HUNT
D. B. KLEIN
GARDNER MURPHY
SAUL ROSENZWEIG
EDWARD C. TOLMAN
MAX WERTHEIMER
BARBARA S. BURKS, *Chairman*

REPORT OF THE INVESTMENT COMMITTEE AS OF DECEMBER 31, 1941

To the Council of Directors and Members of the American Psychological Association:

The invested surplus of the Association is in nine banks located throughout the country and in railroad bonds and U. S. Government obligations. During the year the total interest derived from these sources was \$851.84.

Respectfully submitted,
LEONARD CARMICHAEL
SAMUEL W. FERNBERGER
WILLARD L. VALENTINE, *Chairman*

REPORT OF THE REPRESENTATIVES TO THE COUNCIL OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

To the Council of Directors and Members of the American Psychological Association:

The one hundred and tenth meeting of the American Association for the Advancement of Science was held in Dallas, Texas, from December 29,

1941, to January 3, 1942. Section I (Psychology), meeting on December 29 and 30, held four sessions of contributed papers and two symposia. One of the symposia, organized by E. R. Hilgard, dealt with "Recent advances in the appraisal of personality." The other, organized by A. W. Melton and H. H. Remmers, was devoted to "The psychology of learning and the educative process," and was held jointly with Section Q (Education). The papers read by representatives of the two sections and the discussions from the floor demonstrated a refreshing agreement not only upon the fundamentality of the psychology of learning to both psychology and education, but also upon specific conclusions. On Tuesday evening, Dr. Karl M. Dallenbach, retiring vice-president and chairman of Section I, delivered a systematic and scholarly address on "The temperature senses: their history and present status."

The officers of the Section, elected by the recently adopted election procedure whereby the Fellows of the Section participate in elections, are Vice-President—Henry E. Garrett, Columbia University; Committee Member—William A. Hunt, Wheaton College and U. S. Naval Training Station, Newport, R. I. At the meeting of the Section Committee, Dr. John A. McGeoch was elected to serve as Secretary, *pro tem*, while the Secretary of the Section, Dr. Arthur W. Melton, is in government service as Major in charge of psychological research in the School of Aviation Medicine at Randolph Field. The Permanent Secretary, Dr. F. R. Moulton, had appointed Dr. Melton to membership on the Thousand Dollar Prize Committee, but because of his necessary absence in Army psychological service, one of your representatives, Dr. McGeoch, was appointed to serve in his stead.

It was announced at one of the meetings of the Council of the Association that the membership continues to increase substantially. Section I participates liberally in this increase showing gains in both Member and Fellows.

Section I has become one of the more active Sections of the Association, and continues to maintain cordial and scientifically profitable relations with other Sections. Your representatives record the belief that psychology as a science has much both to gain and to contribute by active participation in the affairs and programs of the American Association for the Advancement of Science.

Respectfully submitted,
EDMUND S. CONKLIN
JOHN A. MCGEOCH

REPORT OF THE REPRESENTATIVE OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION ON THE AMERICAN DOCUMENTATION INSTITUTE

To the Council of Directors and Members of the American Psychological Association:

The annual meeting of the American Documentation Institute was held in Washington, D. C., Thursday, January 29, 1942. The Institute is devoting its major energy to *auxiliary publication*, particularly as applied to the interchange of scientific and scholarly information underwar condi-

tions; to the providing of sets of scientific journals through microfilm; and to facilitating the receipt of current scientific and scholarly journals under war conditions.

Auxiliary publication enables an author to publish a longer report than might otherwise be acceptable for publication by journal editors. The procedure consists of the submission to a journal editor of a complete manuscript, including graphs, tables, or photographed material. The editor may recommend that a shorter article or an abstract be prepared for publication in his journal; but the augmented paper may be deposited with the American Documentation Institute. A document number and price for microfilm of the manuscript is then assigned, and the reference to the detailed manuscript appears with the short article. Specialists who wish to read the full paper may order the microfilm copy from the American Documentation Institute, 1719 "N" Street, N.W., Washington, D. C.

Actually the Biblofilm Service has been transferred to the United States Department of Agriculture, but is used jointly by the Department of Agriculture Library and the American Documentation Institute. A grant of \$5,000 has been made by the Carnegie Corporation to the Institute, of which Watson Davis has been elected President.

Respectfully submitted,
STUART HENDERSON BRITT

REPORT OF THE ASSOCIATION'S REPRESENTATIVE OF THE ADVISORY COUNCIL ON HUMAN RELATIONS OF THE A.A.A.S.

To the Council of Directors and Members of the American Psychological Association:

The Advisory Council has continued its exploration of the value of relationship between a government bureau and a standing committee of scientists. The Council has therefore confined its work as before to a single bureau, the Forest Service. Consultation, however, has gradually extended to all the divisions of that bureau, and in recognition of this changed relationship a liaison committee consisting of the administrative chiefs of the Service has been appointed to facilitate joint activities.

War-time Protection of Forest Lands is of vital concern. Sabotage fires can do enormous damage to production and are a very real possibility—indeed last spring's fires in Rhode Island are believed to be of such nature. Withdrawal of C.C.C. fire protection and the reduction of available civilian volunteer fire fighters brought to the Forest Service acute problems. Through conferences across department lines (much easier for the Council than for persons in one or other government bureaus), the Council was instrumental in drafting a far-reaching plan for fire protection in forest regions analogous to that in urban areas under O.C.D. This plan, which has been adopted with modifications (O.C.D., Operations Letter No. 47), not only provides needed protection against forest fires but serves to make citizens conscious of the value of forests and the need for their conservation.

The need for research in human relations in the Forest Service has

been recognized, and Council is assisting in preparing job specifications for a professional appointee in this area.

A joint conference on Public Relations with leading executives of the Forest Service was held in May, 1942. A lengthy confidential report on this conference has been circularized in the Service.

With the inevitable growth in bureaucracy which lies ahead, it is of vital importance that every possible means of democratic control be explored. One such means is a continuous relationship between related learned and scientific societies and the government bureaus. A standing committee representing many such scientific associations working continuously with a bureau or small group of bureaus, becoming reasonably familiar with the bureau's problems and bringing to the bureau independent judgment, would seem to be a mechanism worth further study. Council has moved slowly—at times both the Council and some members of the Forest Service hierarchy have doubted that the effort was worth while. But progress has undoubtedly been made. There is now general agreement on both sides that the Advisory Council on Human Relation has served the Forest Service in many tangible ways and in still more numerous intangible but recognizable ways.

Dr. H. B. English (representative of A.P.A.) has been reelected Chairman of the Council, and Dr. Douglas Fryer (representative of A.A.A.P.) member of the Executive Committee with the Chairman and the Secretary (Dr. C. E. Lively, representative of the Rural Sociological Society).

Continuation of the Association's representation seems highly desirable.

Respectfully submitted,
HORACE B. ENGLISH

REPORT OF THE DELEGATES TO THE INTER-SOCIETY COLOR COUNCIL *To the Council of Directors and Members of the American Psychological Association:*

The Inter-Society Color Council held its 11th annual meeting February 26 and 27, 1942 at the Metropolitan Museum of Art in New York City. The meeting included a Technical Session on "Color in Art Education" and a Popular Session embracing several aspects of color in art. Exhibits were presented which included work from leading art schools, demonstrating the Munsell and Ostwald color systems, applications of the ISCC-NBS system of color names, and luminous effects in paint. This meeting culminates an effort of the Council to demonstrate to artists the value for them of the pool of technical and practical information that resides in the Council membership. The lack of a dominant and representative artist organization has made the accomplishment difficult. The Council now numbers among its member bodies the American Artists Professional League.

A second new member body, The Federation of Paint and Varnish Production Clubs, has been added to the Council roster bringing the total membership to 13 member bodies with 107 appointed delegates plus 82 individual members.

By letter ballot sent to voting delegates on August 28, 1941 the Coun-

cit endorsed in principle the Commercial Standard for Artists' Oil Paints (TS-3116) of the National Bureau of Standards.

A formal request for adoption of an American Defense Emergency Standard for the specification and description of color has been filed with the American Standards Association. The General Electric Company has been joined in this request by the Inter-chemical Corporation, both firms having made extensive use of the ICI and the Munsell color systems mentioned in the proposal. The Council assisted the A.S.A. to obtain the opinions of its member bodies on the proposed standard.

A Foundation has been established to receive the common stock of the Munsell Color Company to carry on the business of that company on a non-profit basis in order "to further the scientific and practical advancement of color knowledge, . . . and to promote the practical application of those results to the color problems arising in science, art and industry." The business of the Foundation will be managed by a board of seven Trustees including one appointed by the Director of the National Bureau of Standards and one appointed by the Inter-Society Color Council. The Bureau of Standards Trustee is Dr. Dean B. Judd and the I.S.C.C. Trustee is Dorothy Nickerson.

Officers of the I.S.C.C. for the two year period 1942 and 1943 are as follows:—

Chairman—Dean B. Judd (OSA)
 Vice Chairman—Walter M. Scott (AATCC, ASTM)
 Secretary—Dorothy Nickerson (OSA, IMG)
 Treasurer—Norman Macbeth (IES)
 Counsellors—Ralph M. Evans (SMPE)
 —Carl E. Foss (ASTM)
 —Michael J. Zigler (APA)

The Chairman has announced the appointment of the following committee chairmen:—

News Letter Committee—I. H. Godlove
 Problems Committee—F. L. Dimmick
 Finance Committee—Norman Macbeth
 Public Relations Committee—M. Rea Paul

The Chairman recently issued the following notice "I have been instructed by the Executive Committee to remind all chairmen of delegations that the clearing house service of the Council works both ways. If you, or anyone in your Society, have need of color information, particularly if it relates to national defense, write immediately to the delegate or member who can supply the information needed. If in doubt, write to me or to the Secretary and we will undertake to relay your request to the proper person."

The News Letter continues to be a major activity of the Color Council. It regularly contains a wealth of valuable information. One section we wish to call particularly to the attention of members of the A.P.A. is the bibliography of publications dealing with color. It is probably as complete

a list of references as exists on any subject and is maintained up to date with every issue of the News Letter.

Through its Problems Committee, the Council reports important work on several special problems. Under the chairmanship of Dorothy Nickerson with the assistance of Mr. Newhall, the notation for central samples for the ISCC-NBS Color Designation have been published in the J.O.S.A., September 1941. Mrs. Bellamy and Mr. Foss have made up 57 of the color samples involved. These colors are presented in the U.S.C.A. Soil color bulletin, which describes the method and presents a standard chart for soil colors. These 57 samples have been spectrophotometered and the ICI data have been calculated for them by Granville and Foss.

The Committee on the Color Aptitude Test has compiled data on the standardization of the test in three forms, the complete test, an intermediate test for minor deficiencies, and a screening test for major color deficiencies. The intermediate form has proven especially adapted to the study of color perception in children. A complete report on the test is in preparation. It was offered to the program committee of the A.P.A. for the 1942 meeting and will be presented probably at the next meeting of the Optical Society.

A special committee has undertaken to produce a form of color deficiency test, derived from the Color Aptitude Test and particularly adapted to the requirements of the Army Air Forces and the Navy. This test is being standardized in cooperation with the armed services. Commercial availability of the I.S.C.C. color tests will probably be deferred until after the emergency since their production involves priority materials. An adequate number of sets will be available for research purposes.

The report of the chairman of the A.P.A. delegation to the I.S.C.C. at its annual meeting described seventeen problems relating to color, on which seven of the delegates are actively engaged. At least three of the delegates are on active duty with the armed forces. Several of the problems reported by the delegates have direct connection with the war effort.

The A.P.A. has been well represented at all meetings of the I.S.C.C., and its delegates are taking an active part in the work of the Council.

Recommendations:

Your delegation to the Inter-Society Color Council recommends (1) that the A.P.A. continue its membership in the Inter-Society Color Council and (2) that the present delegation be re-elected.

Respectfully submitted,

FORREST L. DIMMICK, *Chairman*
 SIDNEY M. NEWHALL, *Voting Delegate*
 MICHAEL J. ZIGLER, *Voting Delegate*
 FRANK A. GELDARD
 CLARENCE H. GRAHAM
 JOY P. GUILFORD.
 HARRY HELSON
 THEODORE F. KARWOSKI
 ELSIE MURRAY
 LOUISE L. SLOAN

REPORT OF THE CHAIRMAN OF THE DIVISION OF ANTHROPOLOGY
AND PSYCHOLOGY

To the Council of Directors and Members of the American Psychological Association:

Aside from war work, which is now the central function of the Division of Anthropology and Psychology of the National Research Council, a number of important enterprises, begun before the emergency, continue to be carried forward with efficiency.

In its present operation, the Division reflects in a departmental way the total picture of the place of the National Research Council in war-time Washington. Those who have not had close contact with the Division may assume that, because of the creation of an agency such as the Office of Scientific Research and Development, the place of the Council, especially so far as anthropology and psychology are concerned, may have gone into at least a partial eclipse. Actually, the exact opposite is the case. Those in charge of the development of new agencies created by the present war have been careful to work out directives such that existing agencies are able to function with maximum efficiency.

The general work of the Division in the past year has concerned itself largely with the formal and, especially, informal provision of advice to war agencies concerning questions of psychological and anthropological significance. Something of the magnitude of this work may be gathered from the fact that a recent investigation demonstrates that there are 500 professional psychologists at work in the Federal Government. Directly or indirectly, the work of the Division bears in some ways upon almost all of the Federal agencies in which these professional psychologists are serving. This increased activity has been apparent for two years, but as a result of the accelerated tempo of the government agencies concerned with the war, following mid-December the activity of the Division has also become very much greater.

This increased activity was particularly noticeable in the growing willingness of professional psychologists and anthropologists to offer their services in an effective way to the Federal Government. Such a situation made it imperative that the Division Office arrange in some way to formalize the work which Dr. Steuart Henderson Britt, of George Washington University, had been carrying on in an informal way in connection with the placement of psychological personnel. In line with this, the Office of Psychological Personnel was set up in February, 1942. Essentially, this office attempts to deal effectively with the problems raised by the necessity for bringing together specialized psychological talent to serve governmental agencies. For a time it seemed almost impossible that this office, in spite of its importance, could be established, but through the influence of the Emergency Committee in Psychology of this Division, funds were at length made available from the treasury of the American Psychological Association, the Josiah Macy, Jr., Foundation, and the National Research Council to start the new office.

It seems possible that this office may well mark the initiation of a central agency for psychologists which will have an important and growing effect upon the psychological profession in America as a whole.

Psychology has lagged behind many other fields in providing centralized scientific and professional services for its constituent members. Behind the Office of Psychological Personnel, as now tentatively established, is a wide philosophy of service, and already Dr. Britt has shown his willingness to act in many general ways as the efficient servant of American psychology. An office of this sort may properly, at some future date, become a public relations center for psychology. The fact that psychologists are listed on the nation's analytical "talent pool" of the National Roster of Scientific and Specialized Personnel and that Dr. Britt, head of the Office of Psychological Personnel, is an official consultant of the Roster is also important in considering the place of this office in war-time Washington. It might be noted that the members of the Subcommittee on the Listing of Personnel in Psychology are acting in an advisory capacity with regard to the above-mentioned office.

Another new and extremely important relationship between the Division and the specialized war service of psychology was developed in the appointment as a full-time worker of Dr. Charles W. Bray, of Princeton University, as scientific consultant and coordinator on the Committee on Human Aspects of Observational Procedures. This appointment was made in the National Research Council as a result of a contract from the Office of Scientific Research and Development. In carrying out the duties of his office, Dr. Bray acted as a liaison man in relation to a large number of research projects being conducted in vision, audition, and related fields in connection with definite problems of the armed services. Within the last few weeks this Committee has been absorbed into a new Committee on Service Personnel—Selection and Training, also under contract with the office of Scientific Research and Development. Almost all of Dr. Bray's work on this and the previous Committee has been confidential in character, but it may be said that his office is rendering service of great importance to the country and to organized psychology.

Special note must be made here of the work of the Emergency Committee in Psychology. Under the efficient and far-sighted chairmanship of Dr. Karl M. Dallenbach, of Cornell University, the Committee has well served the Division and the needs of the nation in providing a central clearinghouse for information and effective action in the present crucial period. This Committee was first set up when Dr. Carl E. Guthe was Chairman of the Division. As such, it served in certain respects as a "war cabinet" to advise Dr. Guthe and the Division concerning a wide range of questions in the field of psychology. The present Chairman, although a representative of psychology rather than anthropology, has likewise found the Emergency Committee to be a basic and fundamental policy-forming and advisory agency. From many points of view it may also be said that the frequent meetings of the Emergency Committee have maintained an informal and continuous direction of many of the important war functions of the Division.

The Committee on Selection and Training of Aircraft Pilots, financed through grants from the Civil Aeronautics Administration of the Department of Commerce, has continued its significant work during the year. The work of the Committee in general is supervised and its basic philosophy established by the Director of Research of the CAA, Dr. Dean

R. Brimhall. The administration of this Committee was until February 1 under the chairmanship of Dr. John G. Jenkins, of the Department of Psychology at the University of Maryland. On that date Dr. Jenkins resigned from the chairmanship in order to accept a commission as Lieutenant Commander in the United States Naval Reserve, in which capacity he continues to be professionally concerned with the problems of aircraft pilot selection and training. Dr. Jenkins' successor as Chairman of the Committee is Dr. Morris S. Viteles, professor of psychology at the University of Pennsylvania. The Committee has been unusually fortunate in these two Chairmen, who are both internationally known in the field of applied psychology and psychotechnics. During the current year the Committee has also had the great advantage of having as its full-time Director of Research Dr. Jack Dunlap, of the University of Rochester. Much of the work of this Committee, as of other Committees of the Division, is confidential in character. It is safe to say that its work has been most successful. The CAA has made available to the Army and Navy much of the information secured by this Committee as well as using it in its own most extensive selection and training programs.

The Committee on Food Habits has been established in the Division largely as a result of the far-sighted administrative insight of Dr. M. L. Wilson, of the Department of Agriculture. This Committee has been fortunate to secure as its Chairman Dr. Carl E. Guthe, Vice-Chairman of the Division, and as its full-time Secretary the distinguished social anthropologist, Dr. Margaret Mead. The basic problem facing the Committee is the development of suitable techniques and procedures by means of which human foods habits may be modified, especially when such modification is necessitated by development in nutritional science or as a result of the involuntary dietary restrictions of war. The Committee is supervising research and also developing liaison relations with a whole series of Federal and other agencies concerned with its central problem. The activities of this Committee complement the activities of the Food and Nutrition Board of the Division of Biology and Agriculture. While psychology is represented on this Committee, the core of the Committee is drawn from the field of social anthropology.

One of the most interesting and original developments of the current year in the Division has been the establishment of the Ethnogeographic Board. Through the efforts of Dr. Carl E. Guthe the functions of the Board have been crystallized during the last few weeks. The office of the Board, under the direction of Dr. Wm. Duncan Strong, of Columbia University, has been set up in the Smithsonian Institution Building and is being sponsored jointly by the National Research Council, the Social Science Research Council, the American Council of Learned Societies, and the Smithsonian Institution. This office will be essentially a clearing-house and will provide government agencies with information of a geo-ethnic nature on specific world areas. Existing knowledge will be assembled and future research plans laid. Members of the Board will act in an advisory capacity on matters of program and policy.

The Committee on Child Development, under the chairmanship of Dr. R. S. Woodworth, has had throughout the year the continued effective, cooperative work of its secretary, Mrs. Brewer. In November, 1941,

the Committee held a conference on "Emergency Problems of Children and Youth," which was attended by government representatives, members of the Society for Research in Child Development, and members of the Committee. This conference brought to light many urgent problems applicable to the field of child development not only at the present time but in the post-war period, but at the present writing it has not proved possible to finance these new endeavors of the Committee.

Dr. Murdock, with the help of the members of the Committee on the Anthropology of Oceania, has been gathering names of anthropologists, travelers, business men, missionaries, and others who are familiar with Oceania and has completed Installments I, II, and III of the "Personnel List of Oceania." This Committee has also been able to compile a "Personnel List of Asia." These lists have been made available in mimeographed form to many government agencies.

The Subcommittee on Personality Inventory of the Committee on Problems of Neurotic Behavior, with funds provided by the Josiah Macy, Jr., Foundation, last year undertook the preparation of a Personality Inventory, Personnel Form R-2, a group test designed for the preliminary screening out of men with psychoneurotic tendencies designated for the armed forces. This test was prepared by Dr. Walter C. Shipley at the Neuro-Psychiatric Institute of the Hartford Retreat and has been utilized by various branches of the armed services.

The publication and business office of the journal *Psychosomatic Medicine*, published under the auspices of the Committee on Problems of Neurotic Behavior, has been transferred, as of January, 1942, to the Williams and Wilkins Company of Baltimore.

The other Committees and Subcommittees of the Division, including the important Interdivisional Committees, have continued their active or inactive existence as determined by the pressure of the times.

Respectfully submitted,
LEONARD CARMICHAEL

REPORT OF THE REPRESENTATIVE TO THE SOCIAL SCIENCE RESEARCH COUNCIL

To the Council of Directors and Members of the American Psychological Association:

1. *Research planning and publications:* During the past year, two of the regular Council bulletins have been devoted to psychology.

Under the sponsorship of a sub-committee of the Social Adjustment Committee, a 450 page bulletin was prepared by Paul Horst et al., on *The Prediction of Personal Adjustment*. This monograph not only summarizes the literature on prediction, but also includes many new contributions. It has been the Council's fastest selling bulletin.

Another sub-committee of the Social Adjustment Committee has been interested in the motivational aspects of adjustment. A bulletin by Robert R. Sears on experimental attempts to examine psychoanalytic concepts and theory will soon be off the press.

Still another sub-committee has been concerned with studies of foster

children. This committee has been instrumental in securing funds for an extensive study which is being carried out under its direction by Barbara S. Burks.

A fourth sub-committee, on the Social Aspects of the War, has been active in sponsoring a series of memoranda which point out significant research projects bearing on adjustment and the war. The aim is to suggest and outline projects which can be carried out by social scientists in their own communities even though hampered by lack of funds. "Methods of Studying Public Opinion in Relation to the War," by Floyd S. Ruch is of particular interest to psychologists. This has been sent out in mimeographed form to a large number of social psychologists.

The Committee on the Appraisal of Research sponsored Gordon W. Allport's *The Use of Personal Documents in Psychological Science*, which was published in the regular bulletin series of the Council. This committee has under way an extensive experimental investigation of methods used in case studies.

Those psychologists who are interested in problems of crime, will welcome a forthcoming "Planning Report on Criminology."

2. *Fellowship and Grant-in-Aid appointees*: Theodore R. Sarbin was the only psychologist holding a post-doctoral fellowship during 1941-42. His appointment was for training in psychiatric methods for use in research in social psychology. He was reappointed for 1942-43. Else Frenkel-Brunswik has been awarded a fellowship for 1942-43 for advanced academic training in sociology and anthropology.

Three pre-doctoral field fellowships have been awarded social psychologists for 1942-43: John B. Gillingham for field training in a sociological study of the "white collar" employer in selected industrial organization; Melvin M. Tumin for field training in a study of acculturation in selected areas of Guatemala; and Erich Rosenthal for field training in psychiatry.

Grant-in-aid appointees for 1941-42 included the following psychologists:

Margaret W. Curti for a comparative study of the intelligence and certain special abilities of white and colored children in Jamaica, British West Indies.

Wayne Dennis for psychological studies of Hopi and Cochiti children.

Helen B. Lewis for an experimental analysis of the role of the ego in co-operative and competitive work.

H. H. Remmers for a study of group measurement of home environment and its relation to other variables.

Louis Long and Livingston Welch for an experimental study of the reasoning of children from 3 to 10 years of age.

Charles N. Winslow for a study of competition, cooperation and altruism in animal behavior.

For 1942-43, Helen B. Lewis has received an additional grant for the project mentioned above. Others appointed for 1942-43 include:

Roger G. Barker for the completion of an investigation of the effect of severe long-continued frustration upon behavior.

Wayne Dennis for the completion of a field study of identical Navaho twins separated and reared in different cultures. (Pending)

Rosalind Gould for the completion of an experimental investigation of repression.

Ernest R. Hilgard for the completion of a study of the social aspects of housing.

Henry S. Odbert for the completion of an analysis of a word and phrase test.

3. *Psychologists serving on various Council Committees:* The representatives of the Psychological Association on the Council are: R. M. Elliott, Mark A. May and A. T. Poffenberger.

Special committees of the Council include the names of the following psychologists:

Executive Committee—Mark A. May and A. T. Poffenberger

Problems and Policy—A. T. Poffenberger

Appraisal of Research—A. T. Poffenberger

Control of Social Data—Mark A. May

Grants-in-Aid—R. M. Elliott

Pacific Coast Regional—E. R. Hilgard and H. E. Jones

Research Training—H. O. Gulliksen

Review of Fellowships—R. S. Woodworth

Social Adjustment and sub-committees—A. T. Poffenberger, H. A. Murray, E. L. Kelly, M. W. Richardson, Kimball Young, R. S. Woodworth, and J. M. Stalnaker.

Quinn McNemar has been on the staff for 1941-42 and will continue through 1942-43.

Respectfully submitted,
MARK A. MAY

REPORT OF THE COMMITTEE ON PSYCHOLOGY AND THE PUBLIC SERVICE

To the Council of Directors and Members of the American Psychological Association:

The Committee on Psychology and the Public Service is limiting its report this year to a summary of the actual employment of psychologists in the Federal Government at the present time and the probable expansion and turnover that is expected, in the belief that the psychologists who are eager to contribute their efforts to the general war program but who are in doubt as to just how to find the means of so doing will find such a summary informative. Departments can foresee their turnover and needs for personnel expansion only for a limited time. On the basis of the past high rates, however, it seems conservative to estimate an average need of new psychological personnel in the next year equal to twenty per cent of that at present employed on such work.

Everyone familiar with the field of psychology realizes how important to the Government service are the duties performed by psychologists. The number of psychologists in the Army, Navy, and Air Service, as

discussed in issues of the *Psychological Bulletin*,* gives witness to the need for such trained men. We will concern ourselves primarily with activities in the civilian service and have compiled the following information with the cooperation of officials in a number of Government agencies.

The *Federal Security Agency* employs the greatest number of psychologists, and within this agency probably the *Social Security Board* maintains the largest staff of such personnel. In the Occupational Analysis Section of the United States Employment Service, for example, approximately 100 employees with psychology training are engaged in the work of standardization of tests, in job analysis and development of job families, and in training others in the application of occupational information and tests in local offices of the United States Employment Service. Here also work is being done on a study of observable traits with a view to developing a rating device for use in the employment interview.

About 30 of this 100 are assigned to the field, for the purpose of standardizing aptitude tests and trade tests, and in applying these techniques throughout the country. An additional 35 are employed in Washington for the purpose of processing aptitude tests, trade tests, and job family data. The remainder are engaged in various duties, including 7 with statistical training also employed in Washington. In addition, there are local employment offices throughout the country employing persons with psychological training as supervisors in the application of aptitude tests.

No temporary appointments of psychologists are being made now in the Occupational Analysis Section; all are War-Service or probational indefinite appointments not to exceed the duration of the emergency.

For employment in testing and job family analysis in the Occupational Analysis Section graduation from an accredited college with a major in psychology is required. Graduate study is not demanded.

Also under the Social Security Board, the State Technical Advisory Service has about 24 psychologists on its professional staff in Washington and approximately an equal number in the field. Six of those in Washington are in the Research and Test Construction Section. An attempt is made to have at least one person with training or experience in tests and measurements in each field-service region. They are not necessarily psychologists, but psychology has been found to be a good area for recruitment of such personnel. Training both in test construction and in the application of statistical methods to test results is useful in this Service.

The State Technical Advisory Service tries to employ persons who have previously had experience pertinent to the work there. With few exceptions the Ph.D. and M.A. degrees are not necessarily required, although most of the incumbents do hold such degrees, if a person has compensating education in some other field or compensatory experience. Except in unusual cases professional positions are not filled by persons with a B.A. and no experience.

At the present time there are no temporary employees in this Service. At various times in the past temporary appointments on special projects have been made. Several of these temporary employees were later transferred to the regular rolls and a majority of the others secured employment elsewhere in Federal service.

* See "Psychology and the War," *Psychological Bulletin*, March, 1942.

The *United States Office of Education* employs three psychologists, all holding the doctor's degree. One deals with problems of special children, one is a specialist in tests and measurements and handles the consultative and correspondence work in that field, and one is the Chief of the Research and Statistical Service.

The *United States Public Health Service*, also under the Federal Security Agency, employs a number of psychologists. Two are in the National Institute of Health in Washington, the laboratory section of the Public Health Service. One of these works in public health methods, and the other is engaged in research in gerontology. In the Division of Mental Hygiene there is one clinical psychologist at the National Training School, one statistical psychologist in mental health methods, and twelve clinical psychologists in the Federal prisons. These are all full-time field employees except one who is in the departmental service.

All the present employees in these positions have the doctor's degree. A few M.A.'s in psychology are assisting in psychometric work in some of the Federal prisons and one is employed in the Health Education Studies Section.

There are also two psychologists in the *Methods and Controls Section* of the Federal Security Agency, and in *Saint Elizabeths Hospital* there are two full-time psychologists on the staff, both of whom have the doctor's degree and are specialists in clinical work.

The *Civil Aeronautics Administration* is carrying on research work in the selection and training of aircraft pilots. Only a small psychological staff, three psychologists, is maintained within the Administration; the others are employed either directly or indirectly by the National Research Council.

The Psychological Division, Air Surgeon's Office, of the *Army Air Forces** uses psychologists with training ranging from experimental psychology to the applied fields and statistics, all directing their efforts to the problems involved in the selection, classification, and training of aviation cadets as bombardiers, pilots, and navigators. Most of these are officers or enlisted men; a very limited number of professional civilian psychologists are employed. Of the approximately 50 officers, practically all have the Ph.D. degree. The enlisted men, of whom there are about 200, usually have at least a B.A. in psychology. The better qualified of these are sent to Officer Training Schools as soon as possible.

There are 38 persons with training in psychology in the *United States Civil Service Commission*, 6 with the Ph.D. degree and 14 with the M.A. The majority of these are working on problems in the psychological field, particularly development of examination procedures and material, both professional and general; some, however, are engaged in work in other fields. Even in the Commission's testing field there are no formal requirements for graduate study or degrees in psychology. Psychologists are employed to initiate new forms of tests and to review tests made by subject-matter experts.

Among the over 50 persons with psychological training working in the *Department of Agriculture*, 15 have the Ph.D. degree and 10 have the M.A.

* See "Psychological Service in the U. S. Air Corps," John C. Flanagan, J. consult. Psychol., 1942, 6, 153-4.

in psychology, but possession of the degrees is not a formal entrance requirement. Within the last year rapid expansion has occurred within some divisions while others have retrenched. As to the future possibilities for psychologists within the Department no clear-cut prediction can be made. In the Division of Program Surveys there are 23 full-time psychologists. Especially well equipped for efficient work in this Division are social psychologists trained in opinion sampling, attitude measurement, and statistical methods, and those trained in analyzing behavior and the factors affecting it. The Division maintains a continuous system of field reporting to enable administrators to keep abreast of the needs and experiences of the people.

In addition to enlisting the services of the Department of Agriculture Division of Program Surveys, the Office of War Information employs two psychologists studying the opinions and attitudes of the public as reflected from carefully selected key people throughout the country.

The detailed analysis of psychologists working with W. V. Bingham in the Personnel Procedures Section of the *Adjutant General's Department** is not available at this writing.

Practically all these agencies are experiencing turnover because of the employees who are drafted or who enlist in the armed forces. There are also vacancies created by the transfer of employees to other agencies, in many cases to the new War Agencies which must build up staffs and draw upon established agencies to some extent. Only one agency reported anticipating expansion in its work which would entail the employment of additional psychologists. The number here was about 10. On the other hand, no one believed that curtailment of staff or work would be likely to take place.

In the agencies which stated specifically the degrees held by present employees there were 104 Ph.D.'s and 38 with the M.A. These are by no means complete figures.

It is believed that this report covers the Federal agencies that employ the majority of civilian psychologists although a number of other agencies employ a few. Not mentioned specifically in the report are the numerous employees with training in psychology who are not doing work in their special field. In many cases their training, while not directly related to their present position, is of assistance to them in carrying out their duties.

It is recommended that Dr. Steuart Henderson Britt be added to the membership of the Committee in order to facilitate integration of work with that of the Office of Psychological Personnel of the National Research Council.

Respectfully submitted,
WALTER R. MILES,
HAROLD E. BURTT,
KIMBALL YOUNG,
RENSIS LIKERT,
W. V. BINGHAM,
L. J. O'ROURKE, *Chairman*

* See "The Adjutant General's School and the Training of Psychological Personnel for the Army," Major Morton A. Seidenfeld, *Psychol. Bull.*, 1942, 39, 381-4.

REPORT OF THE COMMITTEE ON EXTENSION OF FUNCTIONS
OF THE SECRETARY'S OFFICE

To the Council of Directors of the American Psychological Association:

On the basis of a survey and recommendations by your Committee (*Psychological Bulletin*, 38: 849-65, November, 1942), the American Psychological Association passed a resolution committing itself in principle to an extension of secretarial services. The Association further voted an appropriation to the Committee and gave it the responsibility for further negotiations and for reporting the outcome of its activities to the Council before the next Annual Meeting. Council was instructed to bring to the 1942 Meeting desirable and necessary recommendations for appropriations, constitutional amendments, changes in dues, and definitions of the functions of an extended secretariat.

The progress of the war and events immediately following the 1941 meeting made rapid changes in the problem before the Committee and the Association.

In January, 1942, the Emergency Committee in Psychology requested the Council to create an Office of Psychological Personnel. Similar informal requests for emergency services in Washington came in from a number of individual Members. After a review by the Committee on Extension of Functions of the Secretary's Office the Council unanimously adopted a resolution (*Psychological Bulletin*, 39: 270-71, April, 1942) creating the Office of Psychological Personnel and the position of assistant secretary to be known also as the Executive Director of the Office of Psychological Personnel. Dr. Stuart Henderson Britt was appointed the Executive Director and offices and some secretarial services were secured at the National Research Council Building in Washington through negotiations carried on by Leonard Carmichael, Chairman of the Division of Anthropology and Psychology.

The Committee on the Extension of Functions of the Secretary's Office has met twice, once in Chicago, and once at the meeting of the Midwestern Psychological Association in St. Louis. Dr. Britt attended the meeting in St. Louis and aided greatly in giving the Committee a more intimate picture of the functions of the Washington office.

Dr. Olson went to Washington in May on the invitation of the Emergency Committee in Psychology and presented tentative plans for the continuation of the office in Washington. The substance of the proposals at that time was that the Office of Psychological Personnel be continued under the auspices of the Division of Anthropology and Psychology of the National Research Council and its appropriate committees and that support at the rate of \$6000 a year be continued by the American Psychological Association.

The Emergency Committee approved the recommendations in principle and Dr. Carmichael expressed his willingness to negotiate with officials of the National Research Council for a continuation of space and supervision.

President Stone in late June attended a meeting of a deliberative sub-committee of the Emergency Committee in Psychology held at Vineland under the Chairmanship of Dr. Yerkes. He became convinced that addi-

tional help should be given to the office and that it would be inadvisable to delay until the Annual Meeting for a decision on some of the problems. The July meeting of the Emergency Committee in Psychology concurred and passed a resolution requesting the Association to strengthen the office.

With the assistance of the Committee, the secretary then polled Council on four propositions for immediate action. Council voted to appropriate \$2250.00 at once to continue the office at the rate of \$500 a month for October, November, and December, 1942 plus \$750 to cover the cost of additional secretarial help for the period of August through December, 1942. This action was communicated to Dr. Britt and the various chairmen and officers on August 8, 1942.

Council thus committed the Association for a total of \$6250 for the support of the Office of Psychological Personnel for the fiscal year of 1942. Upon advice of Treasurer Valentine these amounts were appropriated by carrying an unbalanced budget rather than by assessment of the membership.

Your Committee has received recommendations at three levels from a subcommittee of the Emergency Committee in Psychology. The expenditures contemplated under each are given below.

	(1) Present Budget	(2) Proposed	(3) Ideal
Executive Director (part time).....	\$3,000	\$ 3,000	\$ 3,000
Assistant to the Director (psychologist).....	3,000
Secretary-Office Manager.....	1,800	1,920	1,920
Secretary.....	1,800	1,800
Clerk-Stenographer.....	1,440	1,560	1,560
Stationery, paper, postage, telegrams, mimeographing, long-distance calls, typewriter rental, travel expenses, miscellaneous supplies, etc.....	2,400	2,400	2,400
	<u>\$8,640</u>	<u>\$10,680</u>	<u>\$13,680</u>

As a result of these deliberations and experiences the Committee submits the following recommendations to Council:

(1) The Committee recommends that the support of an agency designated as the Office of Psychological Personnel be continued, but does not recommend the consolidation of the various types of work of the Association and the creation of an extended Secretariat at this time.

(2) The Committee recommends that the office be administered by the Division of Anthropology and Psychology through the Director of the Division and its appropriate committees such as the Emergency Committee in Psychology.

(3) The Committee recommends that the Executive Director of the Office of Psychological Personnel be appointed by the Division on the

recommendation of the Emergency Committee. No change in the by-laws of the American Psychological Association will be required by this plan.

(4) The Committee recommends that Council discuss the amount of support, and that Council then transmit the appropriate recommendation to the Association at the Annual Meeting.

(5) The Committee recommends that a recommendation on dues be discussed by Council and transmitted to the Association. The amounts needed will vary according to the decision on recommendation 4 above.

(6) The Committee recommends the continuation of the Committee on Extension of Functions of the Secretary's Office.

Respectfully submitted,

HERBERT WOODROW, *Chairman*

WILLARD VALENTINE, *Treasurer*

WILLARD C. OLSON, *Secretary*

REPORT OF THE TREASURER AND BUSINESS MANAGER OF PUBLICATIONS

To the Council of Directors and Members of the American Psychological Association:

I am transmitting herewith the audited accounts of the American Psychological Association and its publications for the year January 1, 1941, to December 31, 1941.

During the year 1941 there was an increase in the net worth amounting to \$7,159.19. Of this, \$951.84 is recorded interest on savings accounts and investments of the Association, some of which are reserved for special purposes. This surplus brings the net worth to \$56,240.05, a conservative estimate.

The following detail will indicate the status of the various operations of the office of Business Manager and Treasurer as of December 31, 1941:

The *Treasurer's Office* showed a surplus of \$1,763.94 for the year. The income, principally from dues and interest, was \$7,890.36, and the expense was \$6,126.42. The estimated income for the year according to the budget was \$8,300 and the expense was estimated at \$7,300, so that an anticipated balance of \$1000 was almost doubled. The chairman of the various committees who had funds at their disposal helped to keep the expense down but principally, the Secretary produced the Yearbook at about two-thirds of the estimated cost.

The *Publications Office* was operated with a surplus of approximately slightly less than \$6,500. The *Abstracts* shows a favorable margin of \$2,300. The reasons for this margin are the same as they were in 1940: decreased expense principally in the Editorial Office and increased income from a larger membership.

The *Bulletin*, for the first time, has a surplus at the end of the year in the amount of \$479.74. This is partly due to new subscriptions. These subscriptions were secured by offering libraries ten years of back numbers gratis provided they would subscribe for the journal at regular rates. Approximately one hundred new subscriptions were obtained in this

manner. Almost all of them have been continued through 1942. If this record sustains itself through years to come, it settles the problem of effective advertising for our journals. Ordinary appeals used by commercial houses seem to be ineffective when dealing with libraries but the offer of complete sets of back numbers seems to be an incentive which results in subscriptions. In money these subscriptions amount to almost \$700 and in a large measure they make up for the loss of foreign subscriptions occasioned by the war.*

The financial status of all the other journals has been affected by the special club rate to members. This plan is aimed at supplying expensive journals at low cost to our own members who want them. At \$10 only 300 persons subscribed but at \$7.50 we have almost 700 subscriptions. The plan ultimately is to reduce the cost to members even further. An arrangement of this kind also benefits the Journals. Consequently, the *Journal of Experimental Psychology*, which had a large accumulated deficit over a period of years, has had that deficit reduced by \$900 in 1941. Part of this favorable showing is due to a change in format.

The surplus of the *Review* is roughly \$1,000. This surplus confirms the consistent record of this publication. Previously the surplus of the *Review* has helped to carry both the *Journal of Experimental Psychology* and the *Bulletin*.

The *Journal of Abnormal and Social Psychology* has shared in this club rate benefit so that its surplus for the year was \$1,024.83, which can, of course, accrue only to itself.

Although the *Psychological Monograph* volume was delayed in completion, the auditors' estimate was that it would end the year showing a surplus of \$684.11.

The detailed account of the various divisions is shown in the accompanying audited schedule

Respectfully submitted,

WILLARD L. VALENTINE, *Treasurer and Business Manager*

CONDENSED REPORT OF EXAMINATION
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
YEAR ENDED DECEMBER 31, 1941

March 14, 1942

Auditor's Certificate

American Psychological Association, Inc.:

We have examined the balance sheet of American Psychological Association, Inc., as of December 31, 1941, and the statements of income and expense and net worth for the year then ended, have reviewed the accounting procedures of the Association and, without making a detailed audit of the transactions, have examined or tested accounting records

* As of Midsummer, 1942, our journals are being sent only to our Allies. The December 1941 shipment to England was presumably lost at sea through enemy action.

of the Association and other supporting evidence, by methods and to the extent outlined in this report.

A summary of the balance sheets at December 31, 1941, and December 31, 1940, follows:

Assets	Dec. 31, 1941	Dec. 31, 1940	Increase Decrease*
Cash.....	\$75,741.04	\$76,932.18	\$ 1,191.14*
Marketable securities.....	12,910.01		12,910.01
Accounts receivable—net.....	2,735.74	1,220.56	1,515.18
Inventories:			
Valuation placed on stock of back numbers of publications.....	1.00	1.00	
	<u>\$91,387.79</u>	<u>\$78,153.74</u>	<u>\$13,234.05</u>
Liabilities and Net Worth			
Accounts payable.....	\$ 3,331.73	\$ 1,904.98	\$ 1,426.75
Deferred income:			
Unexpired subscriptions.....	23,838.88	20,275.99	3,562.89
Reserved for special purposes.....	7,977.13	6,891.91	1,085.22
Net worth.....	56,240.05	49,080.86	7,159.19
	<u>\$91,387.79</u>	<u>\$78,153.74</u>	<u>\$13,234.05</u>

The following comments relate to the accompanying financial statements and to the scope of our examination:

Cash on demand deposit and in savings accounts was reconciled with the amounts reported directly to us by the depositories, and cash for deposit was received early in January according to advice from the bank. Office cash funds were confirmed by direct correspondence with the custodians thereof. The records of cash transactions for the year were checked by comparisons of the totals of cash receipts recorded in the cash book with deposits shown by monthly bank statements and by inspection of paid checks, invoices or other data on file in support of the recorded disbursements.

Marketable securities, as shown in the following, were examined:

	Interest Rate	Cost	Market Value Dec. 31, 1941	Accrued Interest Dec. 31, 1941
U. S. Savings bonds—Series G, due November 1, 1953.....	2½%	\$ 5,000.00	\$ 5,000.00	\$ 20.84
Chesapeake & Ohio Railway Co., refunding and improve- ment mortgage, Series G, due February 1, 1960.....	2 6/10%	7,802.50	7,840.00	86.67
Totals.....		<u>\$12,802.50</u>	<u>\$12,840.00</u>	<u>\$107.51</u>

The amount stated for accounts receivable was in agreement with the total of a listing of the individual accounts. We did not correspond with

the debtors for confirmation of the balances due. The Association follows the policy of recording dues of members and associates when they are collected; therefore, no asset amount is stated in the balance sheet for these receivables.

Inventories of back numbers of publications, carried in the balance sheet at \$1.00, were summarized for us and are shown in a schedule included later in this report.

All ascertained liabilities of the Association at December 31, 1941 have been provided for in the accompanying balance sheet.

Deferred income represents the unexpired portion of subscriptions to the various publications of the Association at December 31, 1941. We tested the computations of the Association with respect to amounts deferred to cover the unexpired subscriptions.

Information submitted to us indicated that certain funds reserved for specific purposes were not to be considered a part of the general funds of the Association. The Council has authorized cash in the amount of \$3,065.38, carried in a special savings account in the People's Savings Bank in Providence, to be used for post-war reconstruction of psychology. This amount represents the unexpended balance of funds received for the ninth international meeting plus accumulated interest thereon to December 31, 1941. Under the terms of a gift whereby the Association acquired the *Journal of Abnormal and Social Psychology*, any surplus funds arising from its publication are to be used solely for purposes of that journal. The amount of such surplus funds at December 31, 1941 was determined as follows:

Balance at January 1, 1941	\$3,886.92
Net income from operations for the year	1,024.83
Balance at December 31, 1941	<u>\$4,911.75</u>

Disbursements of the Committee for Aid to Displaced Foreign Psychologists for the year exceeded by \$11.05 the amount appropriated and received in contributions. This amount has been charged to income and expense.

Opinion

In our opinion, the accompanying balance sheet and statement of income and expense present fairly the position of the American Psychological Association, Inc., at December 31, 1941, and the results of its operations for the year, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

ERNST & ERNST

Certified Public Accountants

BALANCE SHEET
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
December 31, 1941
ASSETS

<i>Cash</i>			
Demand deposit.....	\$21,158.18		
For deposit.....	<u>876.58</u>	\$22,034.76	
Savings accounts (\$7,977.13 reserved for special purposes).....		53,641.28	
Office cash funds.....		<u>65.00</u>	
			\$75,741.04
<i>Marketable Securities</i>			
U. S. savings bonds—at cost.....	\$ 5,000.00		
Railroad bonds—at cost.....	<u>7,802.50</u>	\$12,802.50	
Interest accrued on bonds.....		<u>107.51</u>	12,910.01
<i>Accounts Receivable</i>			
For sales, reprints, printing costs, etc.....		\$ 3,481.38	
Less reserve.....		<u>745.64</u>	
			2,735.74
<i>Inventories</i>			
Nominal value placed on stock of back numbers of publications.....			1.00
			<u>\$91,387.79</u>

LIABILITIES AND NET WORTH

Accounts Payable

For printing costs and expenses.....

To Authors of Psychological Monographs.....

\$ 3,201.95
129.78*Deferred Income*

Unexpired subscriptions to:

Psychological Abstracts.....

Journal of Experimental Psychology.....

Psychological Bulletin.....

Psychological Review.....

Journal of Abnormal and Social Psychology.....

Psychological Monographs.....

\$11,153.27
4,244.91
3,180.02
2,186.13
1,938.75
1,135.80*Reserved for Special Purposes*

Funds to be used for post-war reconstruction of psychology.....

Surplus funds of Journal of Abnormal and Social Psychology.....

\$ 3,065.38
4,911.75*Net Worth*

Balance at December 31, 1941.....

7,977.13

\$56,240.05

\$91,378.79STATEMENT OF NET WORTH
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
Year Ended December 31, 1941

Balance at January 1, 1941.....

Net income for the year—as shown by accompanying statement of income and expense.....

Deduct portion of net income reserved for special purposes:

Net income of Journal of Abnormal and Social Psychology.....

Interest on funds to be used for post-war reconstruction of psychology.....

\$ 1,024.83
60.39

Balance at December 31, 1941.....

7,159.19

\$56,240.65

\$49,080.86

INCOME AND EXPENSE
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
December 31, 1941

INCOME

	Total	Treasurer's Office	Publications
Dues.....	\$ 6,554.83	\$6,554.83	
Subscriptions paid by Treasurer's Office.....	12,854.66		\$12,854.66
Special combination subscriptions.....	5,389.00		5,389.00
Other subscriptions.....	17,768.75		17,768.75
Reprints and commissions.....	3,315.18		3,315.18
Sale of single copies and back numbers.....	2,805.57		2,805.57
From authors for printing costs.....	3,135.06		3,135.06
Interest on investments.....	951.84	917.54	34.30
Advertisements.....	481.68		481.68
Committee on Aid to Displaced Foreign Psychologists.....	224.00	224.00(A)	
Miscellaneous.....	422.49	193.99	228.50
TOTAL INCOME.....	\$53,903.06	\$7,890.36	\$46,002.70

EXPENSE

Stipends to editors and officers.....	\$ 5,564.13	\$1,899.98	\$ 3,664.15
Compensation to employees.....	5,074.77		5,074.77
Printing costs.....	26,303.88	1,383.69	24,920.19
Reprints.....	2,775.24		2,775.24
Abstractors and translators.....	716.75		716.75
Office expense.....	1,327.99	286.16	1,041.83
Miscellaneous.....	442.82	119.63	323.19
Yearbook.....	1,060.20	1,060.20	
Payments to authors.....	650.82		650.82
Provision for doubtful accounts.....	27.11		27.11
Professional services.....	412.50	362.50	50.00
• Annual meeting expense.....	466.62	466.62	
Committee expense.....	547.64	547.64(A)	
Equipment purchased.....	288.18		288.18
TOTAL EXPENSE.....	\$45,658.65	\$6,126.42	\$39,532.23
NET INCOME-EXPENSE.....	\$ 8,244.41	\$1,763.94	\$ 6,480.47

Note (A): Includes \$200.00 appropriated for committee expense

NET INCOME OF THE JOURNALS OF THE AMERICAN PSYCHOLOGICAL
ASSOCIATION AND OF THE TREASURER'S OFFICE FOR 1941

Treasurer.....	\$1,763.94
Journal of Abnormal and Social Psychology.....	1,024.83
Psychological Abstracts.....	2,348.18
Psychological Review.....	1,003.80
Psychological Bulletin.....	479.74
Journal of Experimental Psychology.....	939.81
Psychological Monographs.....	684.11
Total.....	\$8,244.41

BUDGET FOR 1943

TREASURER'S OFFICE

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

Estimated Income

Dues (M 6.50, A 2.50).....	\$8,450.00
Subscriptions	
Abstracts.....	9,900.00
Bulletin.....	1,650.00
Interest.....	900.00
Sale of Yearbooks and Programs.....	50.00
Assessment (\$2.00 per Member and Assoc.).....	6,600.00
	\$27,550.00

Estimated Expenses

Subscriptions	
Abstracts.....	\$ 9,900.00
Bulletin.....	1,650.00
Office supplies and expense.....	500.00
Telephone and Telegraph.....	100.00
Printing.....	500.00
Proceedings.....	600.00
Yearbook.....	1,500.00
Treasurer's Bond.....	100.00
Secretary's Stipend.....	2,000.00
Treasurer's Stipend.....	400.00
Auditing accounts.....	375.00
Incidentals, Annual Meeting.....	300.00
Intersociety Color Council.....	25.00
Membership in American Council on Education.....	10.00
Committee on Examination Questions.....	300.00
Program Committee.....	25.00
Comm. on Extension of Functions Secretary's Office.....	250.00
Commemorative Number of Psychol. Review.....	25.00
Office of Psychological Personnel.....	12,680.00
Total.....	\$31,240.00

PSYCHOLOGY AND THE WAR

Edited by

STEUART HENDERSON BRITT

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PSYCHOLOGY AS SCIENCE AND PROFESSION*

BY EDWIN G. BORING, ALICE I. BRYAN, EDGAR A. DOLL,
RICHARD M. ELLIOTT, ERNEST R. HILGARD,
CALVIN P. STONE, ROBERT M. YERKES

THE STATUS OF PSYCHOLOGY

As science, psychology has progressed rapidly in the last hundred years, and its present rate of advance is unequaled. But it is still in its infancy as compared with astronomy, mathematics, physics, or even chemistry. Adverse criticism from without and within the science is common, for singleness of purpose, consistency of progress, and wisdom of effort have often been lacking. There has been endless disagreement as to definition of field, diversity of point of view and methodology, and, most disadvantageous of all, partisan support of conflicting or competing basic working hypotheses and systems of thought. All these handicaps are due rather to the peculiarities of the scientist than to the nature of his materials. Despite its false moves and setbacks, psychology stands forth as a field of inquiry and constructive intellectual endeavor which is of profound significance for individual welfare and for civilization. It is reasonable to predict that in the postwar world the services of mental engineering, whose primary scientific basis psychology must supply, will become varied, widely accepted, and highly prized as are those of education, preventive and curative medicine, social work, and comparable professions.

We speak now as self-critical psychologists. It is clear that ignorance and misunderstanding of the nature and values of our subject are universal; that it is confused with various other subjects of study and practice, to its serious disadvantage. Ours, moreover, is not a united, highly cooperative group of specialists.

* This is a supplement to the First Report of the Subcommittee on Survey and Planning for Psychology, of the Emergency Committee in Psychology, National Research Council; see *Psychological Bulletin*, 1942, 39, 619-630. The present report provides further information about the needs of psychology and the possibilities of meeting some of them by establishing a national service agency, and it offers as pertinent exhibits several typical organizations which serve the sciences and professions. The Subcommittee's sole purpose in this statement is to get the subject before psychologists for study and discussion preparatory to wise decision. It should be noted that no particular plan or design of organization is either supported or recommended.—EDITOR.

The American Psychological Association, which in 1892 was established as our first national organization, has been split between science and application, for applied psychology now has its own association, and new organizations representing special interests and local groups are multiplying. Evidently we are working somewhat at cross purposes. The "scientist" still looks askance, although less so than formerly, at the "technologist," and the latter is increasingly restive, eager, and ambitious, under the pressure of insistent demands for service, to enlarge his usefulness. Viewed from above the battle of factions or of individuals, it appears that a bad situation is rapidly becoming worse and will continue to do so unless and until something is done to break down the barriers to effective cooperative action.

CAN THE SITUATION BE IMPROVED?

The Committee on Survey and Planning accepts the challenge and opportunity revealed by this situation and urges its colleagues to consider possible remedies. This report, in addition to setting forth matters of fact which stand as arguments for action, offers exhibits from which a definite plan to promote the further development and professionalization of psychology may emerge. The statement is offered as a supplement to the report made to the Emergency Committee in Psychology, National Research Council, July 25, 1942.

It starts from two premises: (1) that in union, coöperation, mutual respect, singleness of purpose, loyalty to the profession, there is strength; and (2) that unity of purpose and action in a professional group may be achieved best through appropriate organization. From these premises it follows that the question "Can the situation be improved?" becomes "By what kind of organization may the scientific development and professionalization of psychology be furthered simultaneously, in intimate association, and with mutual advantage?" The essence of this report is the proposal of a national service agency and locale for psychologists which in all feasible ways shall promote their science and its applications. A few from among many functions or services which would seem appropriate to such a national organization for psychology will now be mentioned.

NEEDS AND SERVICE OPPORTUNITIES

Placement. To meet the existent emergency demands for psy-

chological service an auspicious start has already been made by the Office of Psychological Personnel, Washington, D. C., in the organization of a central personnel bureau for placing psychologists. We must be prepared to maintain and enlarge this service in the critical period of postwar reconstruction and thereafter.

Public relations. Psychology needs official spokesmen—broad-minded, alert, and influential—who shall recognize it as a duty to work in its behalf whenever and wherever opportunity appears to enlarge its usefulness to society.

Publicity might be developed through bulletins, pamphlets, and press releases of many kinds, as well as by means of lectures and conferences to enlighten the public and spread reliable information as to the nature of psychology and its uses. Of this there is urgent need, because the term is commonly confused with psychiatry, which is a branch of medicine; with psychoanalysis, a method of inquiry or therapy; with psychic research, mental healing, spiritualism, and many activities which are neither sciences nor professions. Through this service the intellectual world as well as the profession should be kept informed about advances in psychological knowledge and its applications. Even the founding of a high-class popular magazine might be practicable and profitable, for there now exist in this country several more or less seriously misleading popular publications which use the name psychology.

Publication. Centralization of the profession's technical organs—journals, monographs, series of books, test materials—should prove advantageous. Although economy doubtless would be the first fruit of such a set-up, it is conceivable that a successful publication office might also become contributory to the support of the national organization.

Certification. The certification of individuals as competent and reliable in their profession is commonly accepted as important alike for the individual, the profession, and the public. Undoubtedly the safest way to establish psychological services for human welfare as reputable and dependable is to attest the ability and trustworthiness of their practitioners. It is an open question whether a national service agency can better perform this function than existing societies.

Regulation of professional conduct. Questions of propriety, desirability, and legitimacy should be judged by a properly constituted body in the light of a professional code. Only a national organization can develop such a code and provide for its satisfac-

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tory application. Through a properly organized service of regulation, psychologists should be able to safeguard themselves against many internal abuses.

Protection. To defend itself against fraudulent practice, dishonest claims, and various abuses of the name "psychologist," a protective service is imperative. Although in all urban centers there are today persons inadequately trained, unrecognized by our profession, and unworthy of certification who practice as "psychologists," neither the profession nor the public has adequate defense against them. Obviously protection against fraud and quackery is a grave social responsibility which rests squarely with the profession.

TYPICAL PROMOTIONAL ORGANIZATIONS

Many scientific and professional groups have created promotional organizations for purposes comparable with those which have been described. Examination of some of these as exhibits should be helpful. Possibly we shall discover among them some which may be used as models in the shaping of a new promotionally effective organization for psychology. We have selected five examples for brief characterization and comment. The selection is based on variety rather than special appropriateness to our needs. They are the American Association for the Advancement of Science, the Federation of American Societies for Experimental Biology, the American Medical Association, the United Engineering Trustees, the American Institute of Physics, and the American Chemical Society. With the exception of the Federation of American Societies for Experimental Biology, all are incorporated. They differ widely in structure, scope, and range of functions. Some are primarily scientific, some professional, and some inclusive of the interests of scientist, applicationist, and the public.

The *American Association for the Advancement of Science* now includes in its range the natural sciences, several of the social sciences, and also many of the applied arts (agriculture, medicine, engineering, education), and for each subject there is a "section." The membership of the Association is limited to individuals, and its objectives are thus briefly defined in the constitution: "To promote intercourse among those who are cultivating science in different parts of America, to cooperate with other scientific societies and institutions, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness." Worthy of remark is the fact that this association of scientists and those interested in the promotion of scientific research has become increasingly

technological in recent years. Its newer sections represent the application of science. The outstanding services of the Association are educational and promotional. As an organization it undoubtedly is a suitable object for study in the present connection, but it probably is not as good a model for psychology as some of the others.

The *Federation of American Societies for Experimental Biology* is precisely what the name implies. It appears to be a rather loose association of scientific groups for their immediate convenience rather than for the well considered promotion of the areas of science which they represent. Its purposes are not defined, and it has neither permanent headquarters nor important continuing services. Among the standing committees currently listed are those on defense of biological research (presumably against antivivisection legislation), international congresses, and public information. There is also a placement service. It may fairly be said that this biological organization stands rather as a warning to psychology than as a suitable organization and service exhibit, for little would be gained by associating existing psychological societies so loosely and with such scant provision for the furtherance of scientific and professional usefulness.

The *American Medical Association* exemplifies perfection of integration, high efficiency of service, and a great concentration of power. Assuming the existence of wisdom and restraint in administration, it should stand as an ideal type of promotional instrument. County medical societies appoint delegates to their respective state societies, which in turn name delegates who constitute the governing board of the national association. The headquarters of the American Medical Association, located in Chicago, Illinois, houses a very complex service mechanism. It is a great informational center and clearing house, and at the same time it is the scene of much aggressive activity for the protection and improvement of the profession.

The American Medical Association is strictly professional, and although a great promotional agency, it makes no provision for the integration of the interests and needs of the biological sciences which are basic to medical and surgical practice, or for their unification with the invaluable applications for which the profession is responsible. Assuredly we psychologists may learn much from the structure, history, and present status and services of the American Medical Association, but its scope is too narrow for it to serve as a model for an organization which includes fundamental science and its applications.

United Engineering Trustees, of which the Engineering Foundation is a subsidiary, was established in 1904 by the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, as "founder societies." "The objects of this Corporation shall be to advance the engineering arts and sciences in all their branches, and to maintain a free public engineering library." Like the American Medical Association, this is a strictly professional agency, for although it avowedly undertakes to further scientific research, otherwise it is only incidentally concerned with the interests and needs of the

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natural sciences upon the development of which engineering largely depends. Neither in the history nor in the present status and functions of this great engineering corporation are we able to discover clear warnings or directives for psychology.

The *American Institute of Physics* is a union of scientific societies which includes the American Physical Society, the Optical Society of America, the Acoustical Society of America, the Society of Rheology, and the American Association of Physics Teachers. "Only corporations, societies or associations devoted to the advancement of physics and having a national field of operation, shall be eligible for election to membership in the American Institute of Physics Incorporated."

The governing board of this Institute consists of fifteen members—three from each of the founder societies. There is also a full-time resident director at the headquarters in New York City. "The purpose of this corporation shall be the advancement of and diffusion of knowledge of the science of physics and its applications to human welfare, and to this end it is part of the purpose of this corporation to undertake, among other measures, the publication of scientific journals devoted wholly or mainly to physics and/or related sciences; to serve the public by making available to journals, newspapers, and other channels of public information reliable communications as to physics and its progress; to cooperate with local, national and international organizations devoted to physics; to promote unity and effectiveness of effort among all those who are devoting themselves to physics by research, by application of its principles, by teaching or by study; and to foster the relations of the science of physics to other sciences and to the arts and industries."

With certain adaptations, the type of organization exemplified by the American Institute of Physics would seem to meet the requirements of psychology. Even the definition of purpose would require but few changes in addition to the substitution of psychology for physics. However, one difference in need between physics and psychology should be considered. Because of the high state of development, general recognition, and influence of several branches of physical engineering, and the existence of promotional organizations such as the United Engineering Trustees, the physicists of the country have naturally concentrated attention on the satisfaction of their needs as scientists and the furtherance of physics as a branch of natural science. Psychology, by contrast, now has the opportunity to attempt to unify its scientific and technological phases by providing in a single organization for the needs of both scientist and mental engineer.

The *American Chemical Society* has both individual and corporate members, and provides alike for scientific and engineering interests. That it represents a united profession appears from the fact that its membership at present exceeds thirty-one thousand. In this case the original society of American chemists has been transformed and adapted to meet the needs and opportunities of a rapidly growing profession. Instead of allowing the scientist group to become segregated, the chemists have associated it intimately with the representatives of chemical and industrial engineering, and in so doing they have succeeded in creating an incomparably progressive and useful center for promotional activity.

"The objects of the American Chemical Society shall be to encourage in the broadest and most liberal manner the advancement of chemistry in all its branches; the promotion of research in chemical science and industry; the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education, and attainments; the increase and diffusion of chemical knowledge; and by its meetings, professional contacts, reports, papers, discussions, and publications, to promote scientific interests and inquiry, thereby fostering public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people."

The American Chemical Society is conducted by its officers and a Board of Directors consisting of certain active or retired officers, six individuals elected one from each of six geographical regions, and four elected at large especially for their business experience and ability. In addition there is an advisory council which consists of the "President, the President-Elect, the Past Presidents, the Secretary, the Treasurer, the Directors, the Editor of the Journal of the American Chemical Society, the Editor of Chemical Abstracts, the Editor of Industrial and Engineering Chemistry, the Chairmen of Divisions, all *ex-officiis*; one representative elected by each Local Section for each one hundred members of the Society in good standing, or fraction thereof it may have as of December 1 of the year preceding, and twelve members elected at large, one-third of whom shall be chosen each year. The President and Secretary of the Society shall be President and Secretary, respectively, of the Council."

Like the American Institute of Physics, the American Chemical Society constitutes an extraordinarily valuable organizational exhibit and model for psychology. The former is constituted by societies as members and is virtually limited in scope to the interests of physics as science, whereas the latter has both individual and corporate membership and is inclusive in scope precisely as, from the point of view represented in this Committee statement, psychology should be.

HOW CAN PSYCHOLOGY BEST ORGANIZE FOR SERVICE?

Psychology cannot be organized *de novo*, since it already has several societies in this country. Nor is it likely that an organization with sections and general headquarters, after the pattern of the American Association for the Advancement of Science, which in other circumstances might be considered ideal, could now command approval. After the critical examination of various possible types of organization and elimination on grounds of relative unsuitability or impracticability, the Committee finds itself reduced to two plans as alternatives: Either an existing society—the American Psychological Association or the American Association for Applied Psychology, for example—may be adaptively modified and its activities multiplied and extended, as was done in the case of the American Chemical Society, or a new organization may be created to function as central service agency in supplementation of

existing societies, as in the case of the American Institute of Physics.

Favoring the adaptive transformation of the American Psychological Association, without change of name, and the extension of its functions are: (a) its historical and functional status as the first psychological society of national scope in the United States of America; (b) the values of the widely known name, American Psychological Association, and of the excellent reputation of the organization; (c) its rights and privileges under federal incorporation; (d) its large and representative membership which at present is several times that of any other psychological society; (e) its disposition, as indicated by recent permissive action, to undertake new services for the profession and its support in the present war emergency of the Office of Psychological Personnel in Washington D. C., as alternative to immediate extension of the functions of its business office.

Because (a) of the recency of its founding (1937), (b) of its relative smallness (600 versus 3000* members in 1942), and (c) the fact that membership in the American Psychological Association is generally considered basic, it is difficult to make a convincing case for the use of the American Association for Applied Psychology instead of the American Psychological Association as a national service agency.

The arguments in favor of a new service organization versus an adapted society, although relatively few, are important. There would be the advantage (a) of preserving the independent status as well as the organization and functions of all the existing national societies, (b) of the supplementation of their services by a new agency and the consequent avoidance of their adaptive transformation and possible subordination, and (c) of opportunity for the science of psychology, especially as represented in the American Psychological Association, and for its applications as represented especially in the American Association for Applied Psychology, to go their own ways independently and in accordance with developments and demands which cannot at present be foreseen.

Independent societies, adequately representative of teaching, research, practice, and major specialties, are essential. Whether an existing organization be adapted or a new one created as a service agency, the various national and local organizations should

* The figures here given for the American Psychological Association include members, associates, and life members.

continue to be of primary importance. The proposed service organization should supplement their activities and be supported and effectively used by them.

We would not prejudice decision between the two types of national organization suggested as alternatives. The differences are not necessarily great, and we are inclined to think that choice is rather a matter of economy and convenience of organization and of expediency than of functional advantage. We believe that either type can be so fashioned and conducted as to develop, protect, and promote psychology as science and profession.

ALTERNATIVE DESIGNS FOR A NATIONAL SERVICE ORGANIZATION

Name and purpose. The name of the proposed service corporation might be, on the one hand, the *American Psychological Association*, or on the other, the *American Institute of Psychology*.* Whatever the name, the purpose of the organization might naturally be defined in accordance with some such outline of functions as was previously set forth and in general after the manner of the statements of objective for the American Institute of Physics and the American Chemical Society.

Membership. In case of the adaptation of the American Psychological Association, the membership should consist of individuals as now, and possibly also of other organizations interested in the promotion of psychology. The Psychological Corporation, for example, might naturally become a supporting member. Presumably every psychologist would wish to be a member of the national service organization as well as of the society which represents his major scientific or professional interest.

The membership of an American Institute of Psychology might be corporate instead of individual and limited to societies national in scope. Each of the member societies could have its individual, and if desired also corporate, membership and its sectional or other suitable and independently administered type of organization. The following might naturally be suggested as founder members of the proposed institute: the American Psychological Association, the American Association for Applied Psychology, the Psycho-

* It should be recalled that there exists an inactive society which was incorporated in the District of Columbia in 1929 as the National Institute of Psychology. Possibly it would be feasible to adapt and use it as an institute for national service.

metric Society, the Society for the Psychological Study of Social Issues, and the Society of Experimental Psychologists.

Directorate. The governing board of the adapted American Psychological Association, numbering not more than fifteen, might appropriately comprise the officers and the requisite number of elected directors. The board should fairly represent psychology as science and as profession. There should be provision also for geographical representation and continuity of service by a minority of the membership. Whereas election should be for one year, desirable previous experience on the board might be provided by having the president elect, the functioning president, and the two most recent past presidents serve as directors. Election of course would be by vote of the membership of the association.

A similar governing board for an American Institute of Psychology might be constituted of members nominated by the several founder societies. Again necessity would exist for a mechanism to assure proper balance and proportion between science and technology, the major specialties, and geographical areas. By reason of the great disparity in membership among the founder societies (roughly from 60 to 3000), proportional representation doubtless would be demanded.

It does not appear that it should be more difficult to work out a satisfactory method for the election and organization of the governing body in the one type of service agency than in the other. In neither case is it likely to prove a simple task to assure and maintain a representative and efficient directorate. The provisions of the American Chemical Society seem complicated, but we doubt that those necessary for psychology, if all desiderata are properly safeguarded, would prove to be less so.

Staff. Whichever the type of organization used, there should be a full-time director chosen by the governing board, an assistant director, a secretariat adequate to the requirements of the office, and such other appointees as might be required for special services.

At this juncture further detail of design seems needless and also undesirable, since we are concerned primarily with principles of organization and relationship and with the proposal of alternative general designs which are considered worthy of critical study and improvement or replacement.

SCOPE AND SUPPORT

As to the magnitude and measure of support for the proposed

service organization, suggestions are more fitting than recommendations. Our consideration of the problems involved and of our professional needs and the possibilities of their satisfaction justifies the opinion that it would be undesirable to undertake the project with an annual budget of less than \$25,000, and that within ten years of successful development \$100,000 should be available annually. Obviously the costs and also the risks in launching a newly created organization would be somewhat greater than in adaptively using an existing society.

The principal source of supporting funds should be the fees of psychologists contributed either directly from membership dues in the American Psychological Association or indirectly by the founder societies of the American Institute of Psychology. For each member or associate, whichever the type of organization selected, it is proposed that the annual contribution be fixed at \$10.00. This, in addition to such dues as society membership might entail, will seem to many a large fee. It is suggested as feasible, if not also optimal, on the assumption that the interest of individuals in furthering and using such a national organization is likely to be proportional to what it costs them. From the first the project should be one of mutual benefit and neither a charity nor a struggling, inadequately supported attempt to do for psychology what obviously should and must be done if it is to develop steadily and healthfully as science and also as profession. At the present rate of growth of the American Psychological Association and the American Association for Applied Psychology, the membership of a national service organization or of its constituent societies in five years will be not less than five thousand.

But there must be also supplementary sources of financial support. As such it is thought that any or all of the following may become important: (a) income from publications such as journals, monographs, books, or tests handled by the association or institute, as the case may be, through its bureau of publication; (b) income from lecture fees, sale of manuscripts, royalties on psychological texts, tests, and apparatus, and from other copyrights or patents which might be assigned to the national organization by socially minded and far-seeing psychologists. If it should appeal to our profession and command acceptance, this innovation relative to receipts from texts, tests, and like sources might speedily so far increase the means of a service organization that its activities could be multiplied and extended rapidly; (c) bequests or

other contributions to capital or maintenance might be anticipated once the organization had demonstrated its usefulness as a non-profit corporation dedicated to the promotion of a service profession; (d) from corporate members there might be received larger fees than those paid by individuals, and, in addition, voluntary contributions; and finally (e) subsidies from foundations and other agencies devoted to the promotion of human welfare might be obtained.

PROCEDURE PREPARATORY TO DECISION AND ACTION

As a procedure which might be expected to bring this matter to the attention and earnest consideration of the psychologists of the country and to action with reasonable promptness, it is suggested (a) that the present statement of the case be made available to all psychologists, (b) that at its next meeting the governing body of each of our psychological societies which is national in scope elect five delegates to a Convention of American Psychologists which shall be held not later than the summer of 1943 to discuss the practicability of establishing a national service agency, the acceptability of some such plan and design as are embodied in this report, and to take such action as will permit definite report and recommendation to the several societies; (c) that at the next following annual meeting of said societies, which presumably would not occur earlier than September, 1943, action be taken on the report and recommendation presented by the delegates.

In the event of favorable action by any given society on the recommendations agreed on by the Convention, it should immediately proceed to elect three members to serve on a Committee on Organization, which would continue to function until duly replaced by a board of governors for the prospective national service agency. The selection of a director would be an early and also an incomparably important task for the Committee on Organization.

THE OFFICE OF PSYCHOLOGICAL PERSONNEL— REPORT FOR THE FIRST SIX MONTHS*

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I. BACKGROUND OF THE OFFICE OF PSYCHOLOGICAL PERSONNEL

On May 4, 1941, Dr. Karl M. Dallenbach, Chairman of the Emergency Committee in Psychology, asked the writer to take over certain responsibilities with reference to psychological personnel. Accordingly, the following persons were appointed and served as members of the Subcommittee on the Listing of Personnel in Psychology, a special subcommittee of the Emergency Committee: Robert A. Brotemarkle, Leonard Carmichael, Edgar A. Doll, John G. Jenkins, C. M. Louttit, Ruth S. Tolman, Steuart Henderson Britt (Chairman). Some of the activities of this Subcommittee have already been described in another connection (1).

The Subcommittee was organized primarily because of a request dated April 29, 1941, from General Lewis B. Hershey, Director of the National Headquarters of the Selective Service System, asking for lists of psychologists who might be available to assist Selective Service Local Boards and Medical Advisory Boards in dealing with the problem of psychometric classification of registrants. With the cooperation of evaluating committees of psychologists in each state, a list of 2,302 names of psychologists (both men and women) was drawn up and submitted to the National Headquarters of the Selective Service System in July, 1941, so that the various Selective Service State Directors and Local Boards in the country could invite the psychologists named to assist in giving psychometric tests. For a great many reasons which need not be described here, the proposed utilization of psychologists by Selective Service Local Boards was eventually abandoned, but this matter is today being dealt with by psychologists who are serving as commissioned officers in the Army Specialist Corps. The work of the Subcommittee on this project was of value, however, from a public relations standpoint, and it also supplied the nucleus

* This is a report of the activities carried on by the Office of Psychological Personnel during its first six months of operation—February 1, 1942, through July 31, 1942.

of a list of psychologists utilized on subsequent occasions by the Office of Psychological Personnel.

The Chairman of the Subcommittee also organized a group of volunteer psychologists in the District of Columbia who during the summer months of 1941 tested 370 registrants for Selective Service Local Boards. A battery of tests was drawn up and administered so that recommendations could be made concerning both literacy and "mental age." Of the 370 men tested, all of whom were referred to the psychologists for special examination, 181 were recommended for deferment and 189 for induction. There is every reason to believe that the recommendations of the psychologists were carefully followed by the Local Boards, but due to various changes in national Selective Service procedures, this project necessarily came to a close. Again, however, this work had the value of bringing to the attention of various officials the significance of psychological work.

A third main project of the Subcommittee on the Listing of Personnel in Psychology was carried on for The Adjutant General's Office, War Department. The Subcommittee was asked to locate all men psychologists of military age who might be interested in a special training program, being established for personnel officers. Through the facilities of the National Roster of Scientific and Specialized Personnel, and with the active cooperation of heads of psychology departments in all sections of the country, detailed information was compiled and forwarded to The Adjutant General's Office regarding various men of military age who had had psychological training. By February 1, 1942, the date of establishment of the Office of Psychological Personnel, several hundred completed questionnaires had been submitted to the Office of the Adjutant General, and questionnaires continued to be received thereafter. The result was that contacts were established whereby psychologists who were inducted into the Army were eventually assigned to personnel and classification work; since then, many have been commissioned as officers in the Army of the United States (4).

In every instance in which the Subcommittee was notified, The Adjutant General's Office was informed whenever a man's status under Selective Service had in any way been changed. In a large number of cases, it was necessary to carry on personal correspondence with the psychologists concerned, in order to answer questions regarding the work of psychologists in various aspects of the de-

fense program and in the war effort generally; and although time consuming, this seemed important in order to assist in supporting the morale of psychologists over the country.

Other activities of the Subcommittee involved contacts with other Federal agencies, especially the Army Air Corps and the Navy Department. After the outbreak of war on December 7, 1941, the amount of incoming mail suddenly multiplied, and during the following weeks the Chairman of the Subcommittee corresponded with hundreds of psychologists concerning their possible utilization in the war effort. Since these functions were absorbed by the Office of Psychological Personnel, no further description is needed here.

II. ESTABLISHMENT OF THE OFFICE OF PSYCHOLOGICAL PERSONNEL

As an outgrowth of the work of the Subcommittee on the Listing of Personnel in Psychology, the Office of Psychological Personnel was established. The OPP was created by the Council of the American Psychological Association as a result of specific recommendations from the Emergency Committee in Psychology (11). The National Research Council offered to lend space of the Division of Anthropology and Psychology of the NRC and to participate in other ways; and in February, 1942, the OPP was officially established in the building of the National Academy of Sciences at 2101 Constitution Avenue, Washington, D. C.

The Chairman of the Subcommittee on the Listing of Personnel in Psychology was asked to serve on a part-time basis in the capacity of Executive Director. He was charged with "the maximum, effective use of psychologists, irrespective of society membership, in the war effort" (11). In other words, there was a clear indication at the outset that this Office was not to be an agency of the American Psychological Association alone, but was to serve all psychologists. In general, projects previously undertaken by the Listing Subcommittee were to be carried on by the Office of Psychological Personnel, together with any new functions which might become necessary.

The Emergency Committee in Psychology applied to the American Psychological Association and to the National Research Council for assistance in setting up the Office of Psychological Personnel, because of the urgency of the war situation. The Office has served as a "clearing house" of information for psychologists regardless

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of professional affiliation, and the Executive Director has performed a number of duties in Washington, D. C., for psychologists living in other sections of the country. Although a brief account has already been published regarding the functions of the Office (3), a more detailed description is in order now.

III. RELATIONSHIPS WITH VARIOUS FEDERAL AGENCIES

The Office of Psychological Personnel has maintained continuing contacts with various branches of the War Department, the Navy Department, the National Headquarters of the Selective Service System, and various Federal civilian agencies which have utilized, or might utilize, the services of psychologists.

1. *Office of the Adjutant General, War Department.* Cooperative relationships concerned with the effective utilization of psychologists in the Army, were worked out with the Office of the Adjutant General, War Department. This work, begun by the Subcommittee on the Listing of Personnel in Psychology, has been continued and enlarged in scope by the Office of Psychological Personnel. Practically all psychologists now in the Army are being utilized in psychological work with reference to personnel, classification, or testing programs. As previously indicated, many of these psychologists have been commissioned as officers; and many others are in Officer Candidate Schools.

The cooperative program with The Adjutant General's Office has worked effectively. As one example out of dozens that might be given, a registrant with considerable background in clinical psychology telegraphed the Office of Psychological Personnel in the spring regarding his immediate induction. The War Department was at once notified regarding the man's training. Later the Office of Psychological Personnel initiated a followup on the inductee, and received word that this man had been "earmarked" and had nearly completed his basic training preparatory to being sent to Officer Candidate School.

The Office of Psychological Personnel has instituted a procedure whereby followup post cards have been sent out at regular intervals to men registered with the OPP whose probable dates of induction have been indicated. The post card reads as follows:

"The questionnaire you filed with the Office of Psychological Personnel indicates your expected date of induction as _____. If there has been any change in your Selective Service Status, or in your date of

induction, please inform this Office at once in order that up-to-date information may be transmitted to the War Department."

As a result, the exact date and place of induction has been supplied to The Adjutant General's Office in practically every instance in which a psychologist has indicated he is entering the Army.

It is essential that every psychologist who is likely to be inducted, or who plans to enlist, should notify the Office of Psychological Personnel some weeks in advance, stating his exact time and place of induction so that detailed information may be sent to the War Department concerning him. At the same time it is also essential that he telegraph to the National Roster of Scientific and Specialized Personnel, Washington, D. C. (an entirely different office), giving the same data. The files of these two offices are entirely separate, and it is only at the National Roster of Scientific and Specialized Personnel (part of the War Manpower Commission) that the problem of consideration as a "necessary man" in civilian occupation may be dealt with effectively.

In those relatively few cases where it has come to the attention of the Executive Director of the Office of Psychological Personnel that a man with psychological training is not being utilized as a psychologist, the matter has been taken up through proper military channels; and as a result most of the psychologists concerned have been transferred to psychological work. In this connection, however, two things should be emphasized. First, it is ordinarily *essential for an inductee to complete his basic military training* before being assigned to psychological duties. Second, training as a psychologist ordinarily means graduate work and experience in psychology, rather than simply an undergraduate major.

2. *Psychological Division, Office of the Air Surgeon, Headquarters Army Air Forces.* During the functioning of the Subcommittee on the Listing of Personnel in Psychology in 1941, certain information was furnished to the Psychological Division, Office of the Air Surgeon, Headquarters Army Air Forces. The data were supplied from three different sources: the National Roster of Scientific and Specialized Personnel; questionnaires filed with the Subcommittee; and the correspondence files of the Subcommittee.

Since then, the Executive Director of the Office of Psychological Personnel has cooperated with the Psychological Division, especially by furnishing data in a fairly large number of cases in which there has been a definite inquiry from a man concerning

psychological work in the Air Forces. First, complete data have been supplied concerning certain specified individuals on whom information has been requested. Second, a project was carried out with relation to approximately thirty men with psychological training who had indicated that they were to be inducted into the Army during previous months but who had not been located through the usual military channels. A careful check on the data concerning these men was made both at the Office of Psychological Personnel and at the National Roster of Scientific and Specialized Personnel, and as a result additional data were supplied to the Psychological Division, Office of the Air Surgeon. Third, information was supplied to various psychologists concerning the necessary steps for a man who wished to volunteer as an enlisted man in the Army Air Forces, and also for one who was likely to be inducted and who desired to be considered for assignment to the Air Forces. This information was given to various psychologists of military age in order to assist them in being classified in this type of work if they so desired (4).

Continuing contacts have been maintained with various officers and civilian personnel in the Army Air Forces so that the Office of Psychological Personnel may, upon request, assist in future projects. A rather large number of psychologists are now serving as officers, noncommissioned officers, and enlisted men in the Aviation Cadet selection and training program of the Army Air Forces, especially at Psychological Classification and Research Sections (12).

3. *Army Air Forces Technical Training Command.* Since many of the problems of selection and training for the Army Air Forces are carried on by the Army Air Forces Technical Training Command, contacts have been maintained both with officers and civilian personnel of this branch. Suggestions concerning personnel have been made, and discussions held on various matters. Certain psychological activities of the Air Forces Technical Training Command have previously been described (7).

4. *Surgeon General's Office, War Department.* Contacts have been maintained with officers in the Surgeon General's Office. To date, six clinical psychologists have been commissioned as First Lieutenants and assigned to clinical duties at Base Hospitals.

5. *Women's Army Auxiliary Corps.* At the time of the formation of the Women's Army Auxiliary Corps in the summer of 1942, there was a need for eighteen women—two in each of the nine

Corps Areas throughout the country—to assist in the selection of Officer Candidates for the WAAC's. Through appropriate channels the names of women psychologists were suggested for this work, and seven were appointed. In other words, of the eighteen women who served as advisers to Mrs. Oveta Culp Hobby, Director of the Women's Army Auxiliary Corps, seven were psychologists: Dr. Florence L. Goodenough, Dr. Jean Macfarlane, Dr. Grace E. Munson, Dr. Helen Peak, Dr. Millicent Pond, Dr. Agnes Arminda Sharp, and Dr. Ruth S. Tolman.

These psychologists came to Washington early in June to confer with Director Hobby; and at the request of Dr. Ruth S. Tolman, Chairman of the Subcommittee on the Services of Women Psychologists in the Emergency, met with the Executive Director of the Office of Psychological Personnel. An article describing the activities of these psychologists has already been published (8).

6. *Army Specialist Corps*. On July 6, 1942, The Adjutant General's Office sent an "S.O.S." to the Office of Psychological Personnel for a list of psychologists from which approximately 200 men could be selected to be commissioned as First Lieutenants and Second Lieutenants in the Army Specialist Corps, to carry on psychological work at Induction Stations throughout the country. The Adjutant General's Office wished to have the information immediately so that necessary application forms could be sent out and returned completed by the middle of July. The following qualifications were specified:

- a. *First Lieutenant*—Minimum salary: \$3,200
Should hold a Ph.D. degree in psychology or may have completed one year of graduate training in psychology supplemented by practical work in psychological testing.
- b. *Second Lieutenant*—Minimum salary: \$2,600
Must have completed a major in psychology at an accredited college or university, plus some post-graduate work or practical experience in psychological testing.

Men in the following categories were to be considered:

- a. Men between the ages of 30 and 45 who have a Selective Service classification other than I-A or I-B.
- b. Men under 30 years of age who have a Selective Service classification of IV-F.
- c. Men with the necessary qualifications who have passed their 45th birthday.

So far as possible, an effort was made to select those men who

came within the limits of these three categories. Within four days after the request was made, the Office of Psychological Personnel compiled and sent to The Adjutant General's Office over 1,500 "hand picked" names.

During the latter part of July the Office of Psychological Personnel had about twenty requests for these application forms from other psychologists not registered with the Office. These names were also sent to The Adjutant General's Office to receive the application forms. In some instances psychologists wrote expressing a particular interest in receiving commissions in the Army Specialist Corps, and asked if the Executive Director would write a letter to the War Department supplementing their applications. Since officers who were considering applications indicated that they would like to learn the names of those psychologists who had specified an especial interest in this work, the names of these men were submitted on supplementary lists.

7. *Navy Department.* Calls have been made and contacts established with individuals in various branches of the Navy Department which are to any extent utilizing the services of psychologists. Also, data have been supplied to the Navy Department in a few instances upon the request of individual psychologists concerning their psychological training. Parenthetically, it may be added that a fairly large number of psychologists now hold commissions in the Navy in the Bureau of Medicine and Surgery, the Bureau of Aeronautics, and the Bureau of Naval Personnel. Certain descriptions of psychological work in the Navy Department have been given in other connections (9, 10).

8. *Selective Service System.* Contacts have also been continuously maintained with officers of the National Headquarters of the Selective Service System. The profession of psychology is now being brought to public attention as a result of two special sets of materials issued by the Selective Service System:

a. The General Occupational Questionnaire has been circulated to registrants throughout the country by Selective Service Local Boards. Question 32 regarding professional and scientific workers was originally recommended by the Committee on Wartime Requirements for Specialized Personnel (Owen D. Young, Chairman), which was a special Committee of the National Roster of Scientific and Specialized Personnel in the early months of 1942 (2). The Executive Director of the Office of Psychological Personnel served as Executive Secretary of the Wartime Requirements Committee. The word "psychologist" was included in the selected list of professional groups printed in question 32 (5).

b. A special Occupational Bulletin No. 10 was released by the National Headquarters of the Selective Service System on June 18, 1942, dealing with the subject of scientific and specialized personnel (5). This Bulletin was sent to all Selective Service State Directors, Board of Appeal Members, Local Board Members, and Government Appeal Agents; and in this Bulletin are listed certain critical occupations as certified by the National Roster of Scientific and Specialized Personnel. As a Consultant to the National Roster, the Executive Director of the Office of Psychological Personnel listed psychologists among the critical occupations; the factual data for this listing were based principally on information in the Office of Psychological Personnel.

9. *Other Federal Agencies.* The Executive Director of the OPP has had personal interviews with individuals in various Federal agencies, other professional societies, etc. This is an increasingly important function if psychologists are to be utilized with maximum effectiveness. Some of the agencies contacted, and the list is not exhaustive, are: the United States Civil Service Commission; the (former) Office of Facts and Figures; Committee on War Information; Office of the Coordinator of Information (now the Office of Strategic Services); Division of Program Surveys of the Department of Agriculture; United States Public Health Service; Foreign Broadcast Intelligence Service, Federal Communications Commission; United States Department of Interior; Social Security Board; Office of the Coordinator of Inter-American Affairs; etc.

In other words, through day-to-day contacts, personal visits, luncheons, conferences, phone calls, etc., the Executive Director has tried to keep representatives of various Federal agencies informed concerning the functions of the Office of Psychological Personnel, and also has attempted to be of assistance to them in dealing with various psychological problems.

10. *Special Conferences.* On April 15, 1942, the Executive Director sent invitations to over fifty Government officials, most of whom were psychologists, to attend a conference on April 23 in the Library of the National Research Council. This conference was called in order to discuss ways in which the Office of Psychological Personnel might be of service to psychologists and other officials in various Government agencies, as well as to receive specific suggestions. The invitation also announced that Dr. Carroll C. Pratt of Rutgers University, Chairman of a special Subcommittee on Psychological Research Projects, would attend the meeting and would be glad to receive suggestions for research which might be

carried on effectively by psychologists in various sections of the country. Dr. Karl M. Dallenbach, Chairman of the Emergency Committee, National Research Council, and Dr. Harold E. Burr of Ohio State University, Chairman of the Subcommittee on Psychological Aspects of Readjustment, also were present. The conference was attended by about fifty-five persons, and several valuable suggestions were made to the Executive Director. That it was also helpful to others was later evidenced by the increasing number of telephone calls direct from the various offices represented at the meeting.

During July several conferences were held with a representative of a large corporation in regard to a proposed meeting at which representatives of the armed services concerned with selection and training programs could be brought together. A list was made up of individuals to be invited, and discussions were held with several of them. Although for a number of reasons the conference could not be held at the time scheduled, a similar meeting may be possible at some later date.

IV. PROJECT CARRIED ON AT THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL

A special project being carried on at the National Roster of Scientific and Specialized Personnel, while not a direct function of the Office of Psychological Personnel, has a bearing on the work of this Office. The National Roster has no direct authority with reference to classification or induction procedures under the Selective Service System, but it is charged with the obligation of assisting the nation in using its trained personnel in the most effective way possible. Although this program relates to specialists in over fifty fields, only psychologists will be mentioned here. Under a cooperative plan with the Selective Service System, the National Roster of Scientific and Specialized Personnel, *in certain cases only*, sends to the National Headquarters of the Selective Service System appropriate information about psychologists of military age, and that Office in turn sends letters about these men through the various State Directors to the Local Boards to assist in proper classification. Cooperative relationships also exist with the War Department with reference to professionally trained men.

V. CONTACTS WITH OTHER PROFESSIONAL SOCIETIES

Various contacts have been made with many professional so-

cieties. Relationships with other professional groups are of genuine value in the professionalization of psychology, since these contacts bring to the attention of leaders in other fields the importance of psychological activities. Although the following list is not exhaustive, discussions have been held with national officers and representatives of such societies as: American Chemical Society; American Institute of Accountants; American Institute of Physics; American Mathematical Society; American Society of Civil Engineers; Civil Service Assembly of the United States and Canada; Institute of Aeronautical Sciences; etc.

Also, the Executive Director of the Office of Psychological Personnel has conferred with representatives of the "Clearing House of Information on Placement" sponsored by the Eastern Psychological Association, and talked with officials of the National Committee for Mental Hygiene in New York City regarding cooperative relationships.

VI. REQUESTS FOR PSYCHOLOGISTS

Largely as a direct result of these various contacts, there have been many requests for the services of psychologists. The two extremes are represented on the one hand by a request for a psychologist to fill an important confidential post in the War Department—and he is now at work in Washington, D. C., in this position—and on the other hand by a request for a graduate or an undergraduate student to serve an internship. Although the Office of Psychological Personnel is not strictly an employment agency, it is apparent that employer-employee relationships constitute an increasingly significant aspect of the work. There are already indications of a shortage in the number of qualified psychologists (5); and a tremendous number of shifts are being made from one job to another which necessitate information being available for both "employer" and "employee."

A list of job requests for the first six months of operation is given below. Some of these were received without any advance inquiry, whereas others were initiated from the Office of Psychological Personnel. *Unless the request was specifically limited to men psychologists or women psychologists, the names of both men and women were supplied in each instance.*

1. From Research Section, Medical Division, Office of the Chief of the Air Corps, War Department, names and information about men who could qualify as Psychological Assistants at the various air fields.

2. An expert consultant on some confidential problems.
3. An instructor at a university for the remainder of the academic year.
4. Two psychologists at P-1 rating (\$2,000 a year) in the field of social psychology.
5. Confidential request for a psychologist in the field of sound localization.
6. Psychologist to direct a three-year research project on the control of venereal disease (salary \$6,000); plus some other psychologists at lower salary levels.
7. Two psychologists trained in experimental psychology and the use of experimental apparatus, qualified to work on pursuit problems.
8. An expert to devise tests and other materials for a national project.
9. An instructor at a university for the coming academic year.
10. The name of a refugee German psychiatrist with anti-Nazi attitudes for aid on confidential project.
11. Confidential request for a psychometrician in New York City.
12. Psychologist between the ages of 25 and 35 trained in educational psychology, especially remedial work, at a salary of about \$3,500 a year.
13. Confidential request for a recent Ph.D. in psychology with a thorough knowledge of apparatus, statistical techniques, and optics; salary \$2,600 with overtime pay.
14. Eight psychologists in the general field of testing.
15. Psychologists at a \$4,600 to \$5,600 level, for work in public opinion analysis.
16. Psychologist experienced in educational psychology, with special stress on remedial techniques.
17. Confidential request for a man with knowledge of the use and construction of special apparatus; about 30 years of age and a recent Ph.D.
18. Request from a governmental agency for 10 psychologists with at least an M.A. degree, to carry on field work. Salary range from \$2,600 to \$3,200.
19. Request from a governmental agency for a specialist in social psychology and propaganda at a P-4 level.
20. Request from a governmental agency for a psychologist to do work in audience research. Salary \$2,000.
21. Psychologist with specialized experimental training, to work in a confidential area at a P-7 level.
22. Request for a psychologist for confidential work in the field of propaganda, at \$5,600.
23. An instructor at a university for the coming academic year.
24. Names of psychologists familiar with problems of fatigue.
25. Followup request regarding the commissioning as First Lieutenants of 6 clinical psychologists. List of names previously supplied.
26. Psychologists with industrial experience to work in the field of test construction; 3 openings at \$2,000, \$3,200, and \$4,600.
27. Psychologists for possible commissions in a special branch of the service.
28. Name of one experimental psychologist for a special branch of the Navy Department.
29. (See Item No. 15.) Additional names for work in the field of public opinion analysis.
30. Women needed by Women's Army Auxiliary Corps to assist in the selection of Officer Candidates. (See Part III of this report.)

31. Names of men psychologists who have both a Ph.D degree and an M.D. degree.
32. Psychologist to carry on a correspondence panel in the opinion field, for a governmental agency. Salary \$4,600.
33. A psychologist for assignment to a special problem by a Federal agency.
34. Psychologist employed in the field of opinion sampling to carry on a confidential research project.
35. Request for young psychologists to be trained as qualifications analysts; salaries, \$1,620 to \$2,600.
36. Request from a governmental agency for a man psychologist trained in social science with specific ethnological field experience. Salary \$5,600.
37. Request for a woman psychologist; requirements at least a Master's degree and some administrative experience. Salary \$2,500.
38. Request for several hundred names of psychologists to assist in a special testing project.
39. A man psychologist with practical experience in civilian defense work for summer employment.
40. Request from a private industrial concern for a psychologist with industrial experience.
41. (See Item No. 24.) Additional names.
42. Request for the names of psychologists to be commissioned as First Lieutenants and Second Lieutenants in the Army Specialist Corps to serve at Induction Stations. Salaries \$3,200 and \$2,600. (See Part III of this report.)
43. Two openings at a men's university: (1) For an Instructor, Assistant Professor, or Associate Professor, salary between \$2,500 and \$4,000. (2) An appointee for the duration with the same considerations as to rank and salary as (1).
44. From a branch of the U. S. Public Health Service for a statistical clerk. Salary \$1,800.
45. A clinical psychologist to work with psychiatrists in a university hospital. Salary \$3,000 to \$3,500.
46. A man available as a resident interne at a training school for boys.
47. A request from a government agency for coders. Salaries \$1,620 and \$1,800.
48. Supplementary information requested concerning men especially interested in work with the Army Specialist Corps.
49. Request from a men's university for "a man who can teach undergraduate college men." Salary \$3,000.
50. A man trained in social science with actual experience in public opinion polling for confidential work for a government agency. Salary \$5,600 and expenses.
51. Request for the names of psychologists in out-of-the-way areas of Virginia and Pennsylvania to serve in their respective Corps Areas in the testing of inductees at Induction Stations. Salaries \$15 and \$10 a day.
52. (See Item No. 51.) Additional names requested in the same area.
53. A man with a special type of experimental training to work on a secret research project.
54. Instructor in psychology in a women's college. Salary \$1,800 to \$2,000.
55. A woman psychologist with secretarial and office experience. Salary \$3,000.

56. A man social psychologist for an agency engaged in secret work. Salary \$5,600.

57. An instructor for a State university. Salary \$1,800.

For all these requests, names were carefully selected for the special qualifications desired, and appropriate lists were compiled. From the lists submitted, a great many psychologists have been employed or otherwise utilized. In certain instances, however, the agency concerned did not take anyone at all, because of changes in policy in the agency, or employed someone not on the list. Even so, the lists have been valuable from a public relations standpoint, since several of the openings were not specifically limited to psychologists and the names of psychologists were thus brought to the attention of various appointing officers. The lists may also be helpful to the various agencies and to psychologists in the event of later job openings. For at least three reasons a complete accounting cannot be given of the number of psychologists actually placed: (1) not all organizations have "followed through" by indicating who was finally appointed; (2) in very few cases have the psychologists concerned communicated with the OPP when they received offers or were newly employed; (3) in certain instances psychologists whose names have been submitted to agencies have turned down offers of employment without notifying the OPP.

VII. "PSYCHOLOGY AND THE WAR" SECTION OF THE PSYCHOLOGICAL BULLETIN

Beginning with the April, 1942, issue of the *Psychological Bulletin* a special section has appeared each month on "Psychology and the War," edited by the Executive Director of the Office of Psychological Personnel. Current information is presented concerning the utilization of psychologists in various aspects of the war effort. Incidentally, the publication of these materials in the "Psychology and the War" section has resulted in a substantial increase in the amount of correspondence of the Office of Psychological Personnel.

VIII. ORGANIZATION OF SOCIAL PSYCHOLOGISTS EMPLOYED BY THE FEDERAL GOVERNMENT

In March the Office of Psychological Personnel was asked by a small committee of psychologists to sponsor and organize a "Journal Club" or informal meeting for social psychologists employed by the Federal government. The need for the organization grew

out of the feelings of some persons that they wished to keep in closer touch with research activities other than their own.

After various inquiries, arrangements were made for a meeting place at Science Service, 1719 "N" Street N.W. A group of about twenty-five psychologists meets every alternate Tuesday evening to hear a paper and to discuss some topic of current interest. The group has consisted of psychologists who hold a Ph.D. and who are working primarily in the field of social psychology, propaganda, and public opinion analysis. The programs have been as follows:

April 7: Dr. Edwin R. Guthrie, review of Neal E. Miller and John Dollard's "Social Learning and Imitation" (Yale, 1941).

April 21: Dr. Leonard W. Doob, "The Work of a Social Psychologist on Problems of Inter-American Affairs."

May 5: Dr. Rensis Likert, "Description of the Psychological Work Carried on by the Division of Program Surveys, U. S. Department of Agriculture."

May 19: Dr. Dwight Chapman, review of Hadley Cantril's "The Psychology of Social Movements" (Wiley, 1941).

June 2: Dr. Goodwin Watson, "Analysis of Foreign Broadcasts."

June 16: Dr. Otto Klineberg, review of two books: (1) Alain Locke and Bernhard J. Stern, "When Peoples Meet" (Progressive Education Assn., 1942), and (2) Isaac Graeber and Stuart Henderson Britt, "Jews in a Gentile World: The Problem of Anti-Semitism" (Macmillan, 1942).

June 30: Dr. Ernest R. Hilgard, "Post-War Planning for Psychology."

July 28: Selden C. Menefee and Audrey Granneberg Menefee, review of monograph by Geoffrey Gorer, "Japanese Character, Structure and Propaganda" (Yale, 1942: prepared at the request of the Council on Human Relations).

IX. SPEECHES BY THE EXECUTIVE DIRECTOR

On several occasions the Executive Director has been asked to talk to other psychologists about the work of the Office of Psychological Personnel, and especially about the most effective utilization of psychologists in the war effort. In each case he has indicated the specific functions of the OPP and also of the Emergency Committee in Psychology; has stressed the significance of the psychological work being carried on by those both in uniform and not in uniform, and by both men and women; has explained in detail the procedures both at the Office of Psychological Personnel and at the National Roster of Scientific and Specialized Personnel for the registration of psychologists; and has invited specific suggestions. The meetings attended are indicated below; in each case the speech was followed by a question-and-answer period:

Eastern Psychological Association, Providence, Rhode Island, April 17 and 18.

Midwestern Psychological Association, St. Louis, Missouri, May 1.
Washington-Baltimore Branch of the American Psychological Association, College Park, Maryland, May 14.

Illinois Society of Consulting Psychologists, Chicago, Illinois, May 16.

At each of the above meetings the Executive Director made it a special point to be available to individual psychologists to discuss their personal questions, and he went "armed" with a supply of three by five cards so that notations could be made concerning each case. The problems discussed were diverse, including those of employment, induction, enlistment, commissions, research opportunities, etc. Upon his return to Washington after each meeting the Executive Director made a "followup" on the request of every individual psychologist who had presented a problem to him.

A radio broadcast and a public lecture were given during the month of July. The broadcast was on Saturday, July 11, 1942, 1:30 to 1:45 P.M. Eastern War Time over the Columbia Broadcasting System on "Psychologists in the War Effort"(6).

The public lecture was on July 29 at The George Washington University on the subject, "What Is Psychology Contributing to the War Effort?"

X. CORRESPONDENCE, REGISTRATION, PERSONAL VISITS, ETC.

Prior to the entrance of the United States into the war, a large amount of personal correspondence relating to defense activities was carried on by the Subcommittee on the Listing of Personnel in Psychology with individual psychologists. Although the bulk of this correspondence was with younger men psychologists, some of it dealt with questions raised by heads of psychology departments and other administrators.

After the outbreak of hostilities on December 7, the amount of correspondence was greatly increased, and it was necessary to answer hundreds of individual letters dealing with almost every possible aspect of the defense program. A sampling of the questions raised and topics discussed is:

- How to get a job in some branch of the government
- How to get a job in a college or university

How to get any job at all

Where to locate some psychologist to take a teaching position that is being vacated

How to get a commission in the Army or Navy

How to be deferred from military duty

How to volunteer in some branch of the service

How to carry on certain research projects

What can be done on the problem of civilian morale

What can be done to assist Selective Service Local Boards

What courses to take in order to prepare for various types of psychological work

What courses to teach relating to defense

What a conscientious objector can do

What any psychologist can do to aid in the war effort

These and other similar questions were raised not only in the ordinary type of letter, but by special delivery and air mail communications, telegrams, long distance telephone calls, and personal visits. Although the Subcommittee on the Listing of Personnel in Psychology was established primarily in order to furnish certain data to the Selective Service System and to The Adjutant General's Office, the scope of its functions rapidly increased to the point where it became a "clearing house" of information. The impression seemed to exist in many quarters that the Subcommittee could procure commissions in the Army and Navy, secure deferments from military service, supply vocational guidance, make contacts with various Government officials, and locate jobs. Needs for such services were, of course, factors in the establishment of the Office of Psychological Personnel.

Correspondence with individual psychologists over the country has continued on a large scale, and the attempt has been made to give each individual's problem personal attention and supply the information desired. This correspondence has resulted in the registration with the Office of Psychological Personnel of a great many additional psychologists, and also the registration of the same individuals with the National Roster of Scientific and Specialized Personnel. The work of these two offices has constantly been integrated with reference to psychologists, so that individuals who register with the National Roster of Scientific and Specialized Personnel receive appropriate forms from the OPP, and *vice versa*.

So far as possible, an attempt has been made by the Executive Director of the Office of Psychological Personnel to talk individually with the psychologists who come to Washington seeking

information and advice regarding various aspects of military work, Federal service, private employment, and related problems.

As already indicated, one of the important functions of the OPP has been to serve as a "clearing house" of information. Several hundred letters and telegrams are received in the Office each month. Correspondence continues to be heavy because of the large number of men and women who have gradually learned of the functions of the Office and who have wished to utilize its services; and also because a great many psychologists with whom contact has been established are "repeaters"—that is, they continue to write in about additional problems. Also there is an increasing number of office callers, many with unusual problems which require and deserve special consideration. Often this means special phone calls to some Government agency which the Executive Director believes might be interested in the specific problem presented, in an effort to arrange an appointment between the psychologist concerned and a representative of the particular agency.

Diverse questions come in from psychologists already serving in the armed forces; from men psychologists who are subject to call under Selective Service; from undergraduates who are majors in psychology; from women psychologists; and from various persons with proposals for research projects. For example, in the latter group, a psychologist presented to the Executive Director a project of such unusual possibilities that, in spite of the fact that he was an alien and therefore could not be employed in the Government service, the Executive Director "shopped around" until an agency was located which he believed might be interested in aiding with the research. The following day this psychologist called to report that this particular agency was interested and was implementing his research project.

It may be added that several committees of psychologists have asked for and received aid on certain special problems. For example, the services of the OPP have been utilized by the chairmen of the following subcommittees of the Emergency Committee in Psychology: Subcommittee on Psychological Research Projects, Subcommittee on Psychological Aspects of Readjustment, Subcommittee on the Services of Women Psychologists in the Emergency, Subcommittee on Textbook in Military Psychology, Subcommittee on Survey and Planning in Psychology, and Subcommittee on Mental Deficiency.

A sample of a fairly typical work day, May 7, 1942, is given below:

Incoming letters from:

- A psychologist asking that General Hershey declare psychologists subject to occupational deferment.
- A refugee requesting information.
- A psychologist wanting to register in the OPP.
- A Private in the Army wishing to attend Officer Candidate School.
- A psychologist requesting questionnaires.
- A woman psychologist desiring employment.
- An undergraduate wishing psychological assignment in the Army.
- A psychologist concerning the utilization in the Army of a former graduate student.
- A father expressing appreciation concerning data sent to him regarding his son.
- A psychologist raising special questions about his Selective Service status.
- A woman psychologist wishing summer employment.
- A psychologist carrying on independent research and wishing to register with the OPP.
- A psychologist expecting immediate induction and asking for help in getting into some specialized work.
- Seven sets of completed questionnaires returned.

Outgoing materials other than replies to above correspondence:

- List of psychologists supplied who are experienced in mental deficiency and clinical methods.
- Letter to a personnel office confirming a conference earlier in the week regarding personnel problems.
- Letter to a psychologist regarding possible openings for him.
- List of names together with copies of psychologists' letters supplied to Psychological Division of the Army Air Forces.

Telephone calls from:

- Psychologist concerning research opportunities.
- A governmental agency regarding lists of names for jobs.
- An office of the War Department requesting copies of transcript of meeting held on April 23 by the Executive Director of the OPP.
- Request for names of psychologists for employment.

Office callers:

- A representative of the United States Office of Education.
- A psychologist regarding his impending induction into the Army.
- A psychologist regarding his desire to obtain a commission in the armed services.
- A representative of the Social Security Board.

Following is a table which gives an over-all picture of the quantity of work done by the Office. This table does not include the liaison activities mentioned in other parts of this report.

OFFICE ACTIVITIES

February 1, 1942 to July 31, 1942

<i>Activities</i>	<i>Approximate Number</i>
<i>Incoming</i>	
Letters, telegram, registration forms, etc.	2,600
<i>Outgoing</i>	
Letters, telegrams, questionnaires, follow up cards, etc.	2,250*
<i>Incoming telephone calls directly concerned with jobs, Selective Service status, registration, and appointments.</i>	800
<i>Office callers on official business</i>	360
<i>Special conferences outside the office</i>	150

* This figure does not include checking files, compilation, and preparation of 57 different lists containing hundreds of names, each selected for certain specified qualifications.

XI. ADDENDUM

The Executive Director of the Office of Psychological Personnel wishes to take this opportunity to acknowledge the wise counsel and guidance of the members of the Subcommittee on the Listing of Personnel in Psychology, the Emergency Committee in Psychology, the Council of the American Psychological Association, the Board of Governors of the American Association for Applied Psychology, the Chairman of the Division of Anthropology and Psychology and officers of the National Research Council, and the many other interested psychologists who have made helpful suggestions.

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PSYCHOLOGY AND THE WAR: NOTES

Training interviewers for government attitudinal surveys. For a number of years the Division of Program Surveys, U. S. Bureau of Agricultural Economics, under the direction of Dr. Rensis Likert, has had a staff of interviewers conducting intensive interviews with farmers to explore all aspects of rural attitudes toward farm programs. With the coming of the war, this survey work was greatly expanded to cover urban as well as rural groups, and its scope broadened to cover topics of national significance in war time.

This rapid expansion meant multiplying the staff, and created a need for training new members in interviewing techniques. The Division became interested in the "non-directive" approach to treatment interviewing which is being developed by Dr. Carl R. Rogers and his students at Ohio State University, and in the phonographic training devices which have been used there. The "non-directive" approach, in which the interviewer is trained to develop techniques which release emotionalized attitudes without directing the client or influencing the expression of such feelings, seemed particularly applicable to the survey task of getting attitudes, and reasons or factors underlying those attitudes. Dr. Likert made arrangements for his interviewers to be given an intensive period of training at Columbus.

In all, forty-two interviewers were sent to Ohio State for this training, each group staying one week. These interviewers had graduate training—seven had their doctoral degrees—in psychology, sociology, economics, and allied fields. Many of them had had interviewing experience of one sort or another.

The training program conducted by Dr. Rogers and Mr. Charles Cannell consisted of conference seminars and supervised field experience. The material presented was of a very practical nature, illustrated by phonographic records of counseling or survey interviews. Some of the topics covered were: creating rapport, structuring of the interview situation, nondirective methods of releasing attitudes, and reporting of interviews. Practice interviewing was carried on in front of the group.

A part of each day was spent in field interviewing in order to practice the methods discussed. During the week, arrangements were made so that one interview was phonographically recorded for each interviewer. The interviewer and often other members of the group listened to the interview as it was played back. Constructive criticisms were made by Mr. Cannell. This recording was regarded by all as one of the most genuinely educational experiences in the program.

The unique elements of this training program are these: it emphasized the fact that in many specialized situations, training can be carried on outside of Washington; and it made use of a highly effective new device, phonographic recording, for the rapid training of the interviewers. According to those in charge of the surveys, the training program did much to improve the field work of these interviewers.

Deferment or postponement of induction. The following item, of interest to psychologists, appears in *Selective Service*, August, 1942, 2, 1 and 4:

Effective August 20, Selective Service registrants applying for commission or enlistment in the armed forces will not be considered for deferment or postponement of induction pending final action on their applications, National Headquarters has notified local boards through their State Headquarters.

This memorandum (L.B.R. No. 144) rescinds authority that was given to local boards in March 1941, to grant deferment from 60 to 90 days, renewable for cause, to registrants who had applied for commission or enlistment when a board was notified of a pending application by Army, Navy, Marine Corps, or Coast Guard authorities. In addition, the current memorandum rescinds permission for local boards to distribute recruiting literature for the armed forces, or to give information concerning enlistment in them.

Where deferments or postponements of induction were granted *prior* to August 20 to registrants whose applications for commission or enlistment are being considered, the memorandum instructs that they shall be continued for the period granted even though it extends beyond that date. However, no new deferments or postponements for such reasons may be granted after August 20, the memorandum stresses.

Under the new procedure, the Army, Navy, and Marine Corps have been requested by National Selective Service Headquarters to immediately notify the registrant's local board whenever a Selective Service registrant is commissioned or enlisted by them. On receipt of such official notice, the registrant will be placed in Class I-C.

Registrants who are commissioned or enlisted in the armed forces after their local boards have ordered them to report for induction will be counted in filling the call for which they had been included, the memorandum states. The local board will list such a registrant's name on Delivery List (Form 151), with the notation that he has been commissioned or enlisted in the specific component of the armed forces which he has entered, and no other registrant will be ordered to take his place.

Committee on Service Personnel. A Committee on Service Personnel—Selection and Training—has been set up in the National Research Council to study problems and carry on research in the fields indicated by its title. The Committee held its first meeting June 20, 1942. The personnel of the Committee consists of John M. Stalnaker, Chairman, George K. Bennett, Walter V. Bingham, C. H. Graham, Commander P. E. McDowell, Lt. Commander H. J. Pohl, M. S. Viteles, Leonard Carmichael (ex officio), and Charles W. Bray, Executive Secretary. The Committee has traveled extensively, studying problems of selection and training, and is now engaged in supervision and coordination of a number of research projects,

BOOK REVIEWS

HOFF, EBBE CURTIS and FULTON JOHN FARQUHAR. Bibliography of aviation medicine. Prepared for the Committee on Aviation Medicine, Division of Medical Sciences, National Research Council, Acting for the Committee on Medical Research, Office of Scientific Research and Development, Washington, D. C. Springfield, Ill.: Charles C Thomas, 1942. Pp. xv+237.

This bibliography contains 5,745 titles selected prior to January 1, 1942, and a number of titles interpolated in the proofs up to May 31, 1942. It is divided into the following main sections which are still further subdivided: (1) History and general aspects of aviation (212* titles); (2) The special physiology of aviation and conditions simulating flight (2,415* titles); (3) The special pharmacology of aviation and conditions simulating flight (58* titles); (4) The special psychology of aviation and conditions simulating flight (76* titles); (5) Aeromicrobiology (33* titles); (6) Diseases and accidents in aviation and conditions simulating flight (818* titles); (7) Selection and assessment of efficiency of flight personnel (765* titles); (8) Training, performance and fatigue of flight personnel (77* titles); (9) Protection of flight personnel. Preventive medicine and therapeutics of aviation (574* titles); (10) Aviation and public health (381* titles); (11) Organization of aviation medicine (98* titles); (12) Special problems (141* titles); (13) General studies in aviation medicine (88* titles) and (14) a list of bibliographies (9 titles). Each section is preceded by a brief introductory statement. In addition there is a complete key to the abbreviations of the journals, handbooks, and commemorative volumes cited, together with an index of authors and an analytic index of subjects. The printing is excellent and the book is conveniently arranged. While psychologists will be particularly concerned with sections 2, 4, 7, and 8, there is much for them in the other sections. This timely and carefully prepared bibliography will be of great value to professional and research workers in the many sciences concerned with aviation.

University of Minnesota

JOHN E. ANDERSON

KROUT, MAURICE H. Introduction to social psychology. New York and London: Harper & Brothers, 1942. Pp. xv+823.

Human relations are at the crossroads. Insights concerning human understanding are urgently needed. Provisions for their application in the management of human affairs are even more urgently needed. Social psychology has a contribution to make by actually helping individuals acquire a body of knowledge and techniques in human relations to help release informed intelligence in the solution of social problems. The author of this new volume in social psychology accepts the challenge and defines the task of social psychology as the teaching of just such "social abilities." To what extent does this book satisfy the implicated demands?

* Exclusive of interpolated titles.

The materials are presented under what, to a good many psychologists at least, would be new captions. The knowledge which is to serve as a guide for better human living as selected by Dr. Krout is organized into twelve chapter captions. Three chapters are concerned with individual growth and presented under the captions of *Environment*, *Heredity*, and *The Organism*, respectively. Seven chapters deal with what may be called man's social growth, and these are presented under the captions of *The Group*, *Culture*, *Symbolism*, *Patterning*, *Survivals*, *Change*, and *Conflict*. And the last two chapters of the book deal with *Leadership* and *Followership*.

Even a glance at the captions suggests a point of view that is slanted toward an understanding of the genesis and growth of social behavior in the light of all available knowledge, whether it be from psychology or related fields of knowledge, particularly anthropology and sociology. In most instances the author makes an honest and sincere attempt to consider problems in as exhaustive a manner as possible. In the chapter on heredity he considers the genetic contributions as well as the studies of IQ constancy. In treating environment as the world the organism grows in, he includes climate, season, food, and biochemical influence, and his chief reference is W. F. Petersen's *The Patient and the Weather*. In the chapter on *The Organism* the relationship of structure to behavior is considered, and studies of the integration of environment and heredity are also critically evaluated. In these first three chapters, in spite of his attempt at exhaustive treatment, there is no reference to well-known studies related to the problems considered. Omitted is *Biology of the Individual*, a comprehensive book on all phases of the biological foundations for personality development, a volume referred to particularly by Gardner Murphy in his article, *The Task of Social Psychology*. Also, though the author stresses the effect of the juices as a phase of environment, no mention is made of the work of Walter B. Cannon—either his concept of homeostatis as described in the more recent *Wisdom of the Body* or his earlier studies of bodily changes in fear and anger. Such omissions are, however, rare.

In the chapters concerned with the growth of human beings in their interpersonal relations Dr. Krout does an excellent job of summarizing the relevant literature. The materials called for in these chapters are scattered over many sources. The job of synthesizing them is no easy one. The nature of group behavior is presented here as far as possible in the light of such experimental studies as have been made on the nature of the group and the roles the individual plays in society. Insofar as there is an attempt to generalize or to group the facts concerning social behavior into laws, his slant is largely toward Gestalt or the field theory explanation. However, Dr. Krout is more than merely a Gestaltist; he also attempts to be a Semanticist and certainly does a better than average job of applying semantics in his chapter on symbolism and the origin of language. In fact, he had Korzybski review his book to test out its semantic validity.

If there is any weakness in the series of chapters dealing with group behavior, it is in the lack of descriptive material as well as interpretative material that could easily enough have been derived from psychoanalytic

or orthopsychiatric literature. In his attempt to report studies of contemporaneous parent-child and intersibling studies he mentions the studies of Galton, Pearson, Leahy, Bradway, Hartshorne, May, and the Iowa group of studies. No mention, however, is made of studies of sibling relations considered from the more psychodynamic point of view. Of this the well-known studies of Dr. David Levy would be illustrative. As a result, there is a certain lack of continuity between the study of individual motivation at work and group motivation at work. If mass hostility of the kind that is now being expressed by Germany is to be explained motivationally—and that is the only way it can be explained—in terms of certain kinds of leadership and followership, to use Krout's words, the matter should be explained in terms of a single individual who projects his own anxieties, hates, suspicions on the nation and makes the nation identify its own mores and codes with his. In his discussion of relevance of patterns of behavior that characterize an individual in his culture, he has made use of Ogburn's concept of the cultural lag, but again there is lack of emphasis on what may be called motivational types as developed in family constellations. That anthropology can be enlightening there is no doubt. This it can be largely because it is easier for us to be more objective about primitive life than about our own life, but the very defects in our social organization make it imperative that, in the light of such objectivity as can be acquired by studying primitive groups, we study our own personal problems with the same degree of objectivity. The content of life is as we have it, not as the primitive life manifests it. To understand Hitler and Hitlerism, to understand also the strength and weaknesses of democracy, we not only need anthropological studies but we need the kind of material that Dr. Krout includes, facts concerning the role of superstition, the role of the cultural lag, the resistance to change, and also motivational studies which he does not sufficiently consider.

The last few chapters of his book on *Leadership and Followership* are excellent. They are certainly relevant, certainly significant. Again a larger emphasis on actual leaders considered from a sort of biographical rather than sheer statistical point of view probably would have been more enlightening. In these chapters the author makes excellent use of present day studies of morale and public opinion and propaganda.

Throughout the book the author does well not only in gathering and synthesizing the facts relevant for the problems he considers but does a better than average job of holding on to his own philosophy. Using experimental studies does not stop him from indicating that he definitely has a fairly consistent point of view toward government, toward politics, toward economics.

All in all, the author manifests a good sense of direction in both expressing as well as attempting to attain his goals in writing the book. He has selected a comprehensive and relevant body of knowledge, has organized the knowledge in the light of a fairly consistent sense of values, and has emphasized facts from the point of view of social significance. To ask for the inclusion of an adequate consideration of technique in human relations in addition, helpful though that might be in the teaching of

social abilities, is to ask for more than can legitimately be expected from one book. The general context should make of it a very serviceable text for a course in social psychology in the hands of a teacher who is socially oriented as well as psychologically informed.

H. MELTZER.

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SIMMONS, LEO (Editor). *Sun chief: The autobiography of a Hopi Indian*. New Haven, Connecticut: Yale University Press (for the Institute of Human Relations) 1942. Pp. xii+460.

The first paragraph of the preface gives a terse description of the character and purpose of the book:

"This is a frank and intimate account of fifty years in the life of Don C. Talayesva of Oraibi, Arizona. It attempts to describe how he came to be the person that he is, and how he thinks, feels, and behaves. It is a comprehensive case history, reported in the first person, for those who are interested in the development of personality in relation to society and culture."

This ambitious attempt proves to have been remarkably well fulfilled. Don tells his story simply and naively from the time of his conception throughout the fifty years of his life. He describes how, as a pair of unborn twins, "we happened to hurt our mother" with the result that she went to a medicine man who, by means of certain magic rites, succeeded in "twisting the twins together to make one baby." From then on his life and experiences are recounted in minute but never repetitious detail.

To the psychologist, one of the most interesting features of the book is its clear demonstration of the sharp separation that can exist between the outer and the inner life of an individual. Don went to a mission school for several years. There he learned to read and write, to speak English and to accept some of the trappings of white civilization. But when his "education" was completed he returned, essentially unchanged, to his people. His belief in the Hopi gods was as strong as ever; he was as faithful in his adherence to all the complicated rites demanded by the old traditions to which he had been reared.

In Don's life, two factors are of paramount significance, religion and sex. Of the latter he discourses simply and without restraint; in the case of the former he admits to certain reservations. There are mysteries, he says, that may not be revealed to outsiders. However, these reservations do not interrupt the flow of his story, in which, with child-like frankness, he describes the rites by which almost every detail of the private life of a Hopi is governed.

Professor Simmons has done an exceptionally careful piece of work in collecting and editing this material. For the most part the autobiography was dictated to him by Don himself at the latter's home in Oraibi. This material was supplemented by a diary kept by Don for a period of several months at Professor Simmons' request. Finally, after the book had been completed, it was read through to Don from beginning

to end at which time he was asked to correct any misstatements and to add comments which were incorporated into the manuscript. The autobiography as it stands is condensed from the reports of approximately four hundred hours of interviewing and about eight thousand pages of diary. It is written in the first person and as far as possible in verbatim terms.

The autobiography itself is preceded by two prefatory chapters. The first describes the manner of securing the data while the second presents a picture of the conditions of Hopi life in Oraibi in the past and at the present time. The book closes with a discussion of the case history as a method of scientific research, together with several appendices dealing with various aspects of Hopi culture, including an account of the myths and legends most frequently mentioned in the autobiography. A number of excerpts from Don's written diary are also included.

FLORENCE L. GOODENOUGH.

University of Minnesota.

STARCH, DANIEL; STANTON, HAZEL M.; KOERTH, WILHELMINE. Psychology in education. New York: D. Appleton-Century, 1941. Pp. x+722.

Here is an interesting example of the transformations taking place in educational psychology texts at the present time. We quite agree with the statement by Doctor Starch in the preface to the effect that texts in this field have usually emphasized everything else except the functions of the teacher, and that teachers of educational psychology have been no better than the average college instructor. So with this thought in his mind, the author of one of the leading educational psychology texts of a generation ago apologizes for that text, after having spent some twenty-five years in industrial and business psychology, and with the help of his associate authors, endeavors to write a *functional* educational psychology, "... to bring to the desk of the teacher what psychology has to offer to help him or her to be a better teacher."

This is obviously not a text for a first course in psychology. It assumes that the student has had a course in general psychology. In order to avoid needless repetition the basic facts regarding learning, remembering, thinking, personality, study habits, and the like, which were discussed in *Controlling Human Behavior*, a first book in psychology, by the same authors, are not repeated in this book." Nine chapters are then devoted to: the aims of education; the characteristics of good teachers; the functions of: understanding young people, motivating their learning, measuring their progress, making education transfer, and personal counseling of pupils. Ten of the remaining eleven chapters are devoted to "guiding pupils in learning specific subjects." Thus half of the book is concerned with the psychology of specific school subjects. The last chapter, entitled, "Developing Pupils as Persons," reiterates the theme of the first half of the text, that formal education really should be considered as personality development and not subject-matter teaching. Doctor Starch assumes responsibility for the general conception and organization, and for three chapters. Doctor Stanton is chiefly respon-

sible for eight chapters and jointly with Doctor Starch for one chapter. Doctor Koerth is chiefly responsible for eight chapters.

The first two chapters, written by Doctor Starch, discuss the meaning and aims of education. We agree with him that it is important to begin an educational psychology text with some discussion of the aims of education. How else can we help the teacher apply psychology to education if we have only vague ideas of what education aims to do? But we certainly must object to Doctor Starch's method of ascertaining these aims. Although his reminiscences from his own school days, his own personal philosophy and opinion concerning life's objectives and how to attain them, are all interesting; the reviewer fails to see why they should be foisted upon the student when educational philosophers and curriculum specialists have developed much more carefully thought out and complete statements of the aims of education in the United States (e.g., The Educational Policies Commission's monographs). A chapter on the aims of education should certainly acquaint the student with the existence of, and the essential ideas of these formulations of our leading educators. It is not the function of educational psychology to *decide* the aims of education, but to implement their attainment. It is true that some original consensus material of an interesting nature is presented in this chapter (e.g., what are the one hundred greatest books according to one hundred "competent" persons); but it is incidental to the main problem of the chapter and obtained from specialized and/or not too well defined groups. The chapter contains no bibliography!

Chapter III, "The Teacher as Guide," is misnamed. It should be entitled, "Characteristics and Training of Successful Teachers." It brings together a number of the recent attempts to determine the distinguishing characteristics of successful and unsuccessful teachers, and discusses briefly some problems of teacher training and selection. In no part of the chapter is there any description of how the teacher serves as a guide in the learning process except to exude "personality plus."

Chapters IV and V are entitled, "Understanding and Directing Young People." In Chapter IV there is a very brief and superficial discussion of growth and maturation, including an interesting confusion in the use of the term, "maturation" (p. 78) and a definite misinterpretation of the results in roller skating in the Johnny and Jimmy experiment (p. 79). The rest of the chapter continues this superficiality in its treatment of motivation and its emphasis upon self-interest as the main motive to which the teacher should appeal. Some good rules for appealing to self-assertion or self-interest are presented. The chapter ends with a decalogue of precepts for appealing to self-interest and motivating through induction (inducing imitation or emulation). Three pages are devoted to punishment; but they contain no reference to any experimental studies of praise and blame. There is a somewhat better discussion of motivation occurring in Chapter VI; but no cross-reference helps the reader get there.

Understanding and directing intelligence behavior is the aim of Chapter V. Here the concept of intelligence is presented and the value and limitations of intelligence tests in evaluating intelligent behavior are

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discussed. In this chapter the reader gets no conception of the nature of such tests; yet theories of intelligence are discussed and names of specific tests are listed in rapid succession. The 1937 Stanford Binet is mentioned; but when a table of IQs is given, the 1916 distribution is quoted. A rather sketchy discussion of the influence of hereditary and environmental factors in producing differences between intelligence test ratings is presented. This includes a confusion of the meaning of identical and fraternal twins (p. 133) and a failure to keep up to date on the Newman, Freeman, and Holzinger twin study. Page 134 states that ten pairs of separated identicals were studied; while, as we all know, these authors report in their book published in 1937, data for nineteen separated pairs studied by themselves and one pair studied by Mueller. A later chapter by Koerth rehashes the nature-nurture question, apparently oblivious of the earlier chapter, and shows knowledge of the nineteen pairs of separated identical twins (p. 243). But it ignores the Iowa studies of the IQ; while the earlier chapter accepts them at face value and fails to caution the reader that severe criticisms of these studies have been made by several competent psychologists.

"Getting Pupils to Work and Learn" (VI) devotes twenty-four pages to a somewhat better treatment of motivation than that found in Chapter IV. It contains, however, an inexcusably poor presentation of learning curves, retention, and the factors affecting forgetting. The reader is referred to the authors' general psychology for all graphic material and they say, "These aids to learning and the laws of learning, as well as many other factors, are more fully presented in several chapters of *Controlling Human Behavior . . .*" (p. 183).

"Measuring Progress and Achievement" (VII) contains a fairly good brief discussion of the purposes of measurement and the various types of measurements used in schools. The concept of reliability is poorly presented (p. 218) and the author assumes that the reader knows the meaning of correlation (p. 217-8). The attempt to present the "minimum reading knowledge of statistics" in nine pages without simple problem illustrations (226-34) is a waste of paper.

"What Education Can Do" (VIII) is a combination of the second discussion of the nature-nurture problem mentioned above and a treatment of the conventional topic of transfer of training. The author assumes that the reader already knows the meaning of the psychological problem of transfer in education. And accordingly with a very brief "review of terminology," plunges right into theories of transfer, telling the reader to turn to Starch (1927), Pressey (1933) or Woodworth (1938) for the reports of experimental studies in this field. The discussion contains very little mention of specific studies in either the laboratory, or what would be more important, the classroom. The technique of a good transfer experiment is not described at all. Thus the student has no preparation for judging the worth of future studies he may encounter in educational journals.

"Personal Counseling" (IX) takes seven pages to tell us that the teacher must like children and have an attractive personality. Then follows some discussion of behavior problems and how the guidance clinic

can aid the teacher. Alas, the majority of teachers are in systems which can operate no such clinics as are here described. Such teachers must be their own clinicians to a large extent. Ten rather valuable pages on delinquency are based mainly upon the studies of Healy and Bronner. The chapter closes with a discussion of the ramifications of guidance.

For a number of years the reviewer has been convinced of two things. First, one cannot write a general educational psychology text and a discussion of the psychology of each school subject in one volume. Second, it is impossible to discuss satisfactorily in one chapter the psychology of both the elementary and secondary levels of a given subject-matter field. These two things the present authors have tried to do without too much success. The ten chapters on various subject-matter areas are of varying worth. In general they are too discursive and do not present the really valuable work which psychology and experimental education have done in these areas in: determining objectives in terms of pupils' interests and needs in later life; determining the abilities and concepts which can be readily taught at various stages of development (e.g., the mathematics chapter makes no reference to the work of Washburne and the Committee of Seven on the mental age placement of various arithmetical abilities); studying more efficient methods of learning; diagnosis and treatment of disabilities; etc.

Among these subject-matter chapters the following impress the reviewer as better than the others: reading, English language, English literature, and social studies. The last of these, however, fails to incorporate much of the research that it should. In the chapter on reading (p. 342) the author apparently accepts the value of the Ophthalm-O-Graph and the Metron-O-Scope as instruments for the classroom teacher (an assumption which some leaders in the field of reading seriously question) and yet the statements on pp. 349-50 would seem to contradict this acceptance. The bald statement in the chapter on foreign language that "Bilingualism has been found by investigators, both here and abroad, to act as an educational handicap," should be considerably modified by reference to Arsenian's study which the author of the chapter lists in her bibliography.

"Developing Pupils as Persons," the last chapter, is fairly good, yet the principles of personality development do not seem to stand out clearly in the discussion. Allusions like the one to Mark Hopkins (p. 699) and to Sturm and Drang (p. 703) would mean nothing to many readers unless explained.

Some serious lacunae not mentioned in our discussion of various chapters, it is the reviewer's duty to mention. We think that Doctor Starch himself hardly believes it; yet in the preface he has said, "No one should teach unless he has the capacity, stamina, and zeal to be the best teacher in his institution." Woe unto the teaching profession if this precept is accepted. On p. 77 the legend under the figure states that the curves are based on *observed* differences in mental growth; while it is still a matter of controversy as to whether the inferior stop mental growth sooner than the average, and the superior continue to grow for a longer time than the average. The text of the page says, "hypothetical curves,"

but the meaning of hypothetical will not get across to the majority of readers.

Out of a clear sky, with no reference to the source and no explanation of the study, the statement is made in italics, "Thorndike's learning curve implies that learning ceases as we mature" (p. 179). Apparently the author is talking about Thorndike's study of adult learning performance at various ages in comparison with that of elementary school children and high school students. Such a misinterpretation would be bad enough for a layman; but is inexcusable when committed by three psychologists.

In the chapter on reading much material is quoted from Doctor E. A. Betts and among recent developments in remedial reading work is mentioned his clinic at the Oswego New York State Normal School. It is a matter of record that Doctor Betts became Research Professor of Elementary Education at The Pennsylvania State College in September 1937, developing and directing the reading clinic at that institution from that date to the present. Much published research has appeared under his name from his present position.

In discussing the Minnesota Vocational Test for Clerical Workers (p. 602), Andrew is referred to as "he," when the person being discussed is Dorothy M. Andrew, co-author of the test. Andrew's study is also definitely misquoted. Stanton says, "Andrew analyzed the results of 155 women in the Minnesota vocational test for clerical workers and found four relatively independent factors, namely, academic, clerical, spatial, and dexterity abilities." Andrew and Paterson say, in the manual for test, p. 3, topic VII, "Analysis . . . indicates that the Clerical Test is measuring a specific ability which is relatively independent of spatial, dexterity, and academic abilities. For heterogeneous groups, the Clerical Test becomes more closely related to academic ability." Such careless reading is inexcusable.

In general, this text suffers from all the faults of multiple authorship. A table of contents is essential in a textbook and might have helped the organization of many of the chapters. There are too many mere page references to the general psychology text by the same authors when the principles and facts so referred to should have been at least briefly mentioned in the present book. On p. 154 they tell us that the competent teacher "should know the art of teaching as well as the science of teaching." Maybe the present volume will give them some inspiration for the *art* of teaching; but it certainly will not impress the student with either the *science* of teaching or the *science* of educational psychology.

It should be said that the authors have presented a number of valuable suggestions and illustrations, and have gathered material from a number of studies not reported in other texts. Certainly there are sections which students may profitably read. Yet it would seem that in their effort to produce a truly functional educational psychology text to follow a course in general psychology, the authors have not succeeded.

EDWARD B. VAN ORMER

The Pennsylvania State College.

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of the acuteness of hearing of children in the Delaware Public Schools by means of the 4-A Audiometer (Phono-audiometer). (Mimeog. ed.) Wilmington: Division of Special Education and Mental Hygiene, Board of Education, 1942. Pp. 64.

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NOTES AND NEWS

EDMUND SMITH CONKLIN, professor of psychology at the University of Indiana, died October 6, 1942, at the age of fifty-eight years.

WALTER BOWERS PILLSBURY, of the University of Michigan, retired at the age of seventy years on September 26, and was named professor emeritus of psychology. He joined the faculty of the university in 1897 and has been associated with the College of Literature, Science and the Arts continuously for forty-five years. The Board of Regents cited Professor Pillsbury for the large part he played in the development of the university's department of psychology and for his "noteworthy research, teaching and writing . . . his eminence as a scholar . . . and the genuine affection of students and colleagues inspired by his wholesome character and unassuming friendliness."

MADISON BENTLEY has returned to Cornell University as lecturer in psychology. Besides instruction and research, he will edit and publish *The American Journal of Psychology*, relieving CAPTAIN K. M. DALLENBACH, who has entered active service in the Plans and Training Branch of the Adjutant General's Office.

DR. R. W. HUSBAND, of the department of psychology of the Pennsylvania State College, has joined the Research Division of the Industrial Relations Department of the Carnegie-Illinois Steel Corporation.

HENRY M. HALVERSON, associate professor of psychology, Yale University, has been appointed director of the newly organized graduate course for workers with handicapped children at MacMurray College, Jacksonville, Ill. The course, which has been planned in cooperation with the Illinois State Department of Public Welfare, will lead to the degree of Master of Arts. Students may specialize in testing or in work with the deaf, the blind, the psychotic, the feeble-minded, the delinquent, the orthopedic, or the problem child who is properly classed as normal.

DR. ROBERT G. BERNREUTER, professor of psychology at the Pennsylvania State College, has been granted a leave of absence to accept a major's commission in the U. S. Army Specialists' Corps.

DR. BURTON M. CASTNER, formerly of Yale, and recently with the New Jersey Department of Institutions and Agencies, has been appointed Supervisor of Clinical Psychology for the Youth Correction Authority of the State of California. The Authority, recently created by Act of the California Legislature for the purpose of dealing with cases of young offenders, has opened its first Diagnostic and Classification Clinic at the Preston School of Industry, Waterman, California, where Dr. Castner will be located for the present.

DR. AUSTIN H. RIESEN, of Yale University, has been promoted to an assistant professorship in psychology at that institution.

C. GILBERT WRENN, professor of educational psychology, University of Minnesota, has been granted leave of absence for service as a Naval Reserve Officer.

DR. C. W. MANN, formerly of the University of Denver, has been made assistant professor of psychology and director of the Testing and Guidance Bureau at Louisiana State University, DR. MANN replaces DR. E. DONALD SISSON, now in service with the armed forces.

DR. LUCIEN M. HANKS, Jr., of the University of Illinois, has been appointed to the staff of Bennington (Vt.) College, in the department of anthropology and psychology.

National Council of Women Psychologists. In June, of this year, a group of women psychologists completed the organization of *The National Council of Women Psychologists*, the purpose of which is to make more effective use of the services of women psychologists during the national emergency. Up to September 1st, 241 Fellows and 17 Associates have joined the N.C.W.P. Three local centers have formed: New York City, Rockland County, N.Y., and Philadelphia, Pa., with others taking steps to form or considering such formation.

The officers of the N.C.W.P. are: *President*, FLORENCE L. GOODENOUGH; *Vice President*, HELEN PEAK; *Treasurer*, THEODORA M. ABEL; *Executive Secretary*, GLADYS C. SCHWESINGER. On the *Board of Directors* are: MARION A. BILLS, ALICE I. BRYAN, EDWINA A. COWAN, FLORENCE MATEER, MYRTLE B. MCGRAW, HARRIET E. O'SHEA, RUTH S. TOLMAN, and DORTHY VAN ALSTYNE.

Activities already undertaken include: the preparation of outlines for lectures, discussion groups, and courses of study in fields of psychological interest for laymen, these outlines to be used by psychologists ready to lead their communities through lectures, group discussions, and adult education activities. Already available are: 1. *Meeting Emotional Strain in School Teachers* by RUTH STRANG. 2. *Training Leaders in Discussion Groups, Clubs, Projects, Activities* by HARRIET FJELD. 3. *Problems of Youth* by RUTH VALENTINE. 4. *Teaching Babies to Eat: War Time Conditions* by ROBERTA CRUTCHER. These outlines can be obtained from the Chairman of the Committee on Outlines, DR. KATHRYN MAXFIELD, 511 West 113th St., New York City, at a nominal cost. Other outlines are in process of formation or contemplated. It is also hoped that the services of women psychologists can be utilized in effective selection of recruits for the WAVES.

Local projects will obviously vary with the needs of the community. In New York City, authorization is being extended or considered for the following: 1. A course in Mental Hygiene for AWVS. 2. An objective scale for rating volunteers at the OCVD. 3. A program for morale activities in Manhattan. In Rockland County contacts have been established with various social and educational agencies and psychological services volunteered. The Philadelphia center is being utilized in recruiting and interviewing auxiliaries for the WAACS.

The *National Council of Women Psychologists*, nationally, locally, and

through its individual members, stand ready to carry out suggestions or requests for war time service that lie within their powers to perform. Persons interested in the activities of the Council may communicate with GLADYS C. SCHWESINGER, Executive Secretary.

Rotating Internships in Clinical Psychology in New York State Institutions. A program offering training in clinical psychology through rotating internships in New York State institutions is sponsored by an inter-institution committee appointed by DR. NOLAN D. C. LEWIS, Director, New York State Psychiatric Institute, and directed by DR. ELAINE F. KINDER, Chief Psychologist, Rockland State Hospital, Orangeburg, New York.

The cooperating institutions include: Letchworth Village, a state school for mentally subnormal individuals, with a well-established research department; Rockland State Hospital, which, in addition to a large adult population, has a children's unit of a hundred and thirty children four to twelve years of age presenting severe behavior disorders; the New York State Training School for Boys at Warwick, an institution for delinquent boys, with a well-established clinical service; and the New York State Psychiatric Institute, a teaching and research institution within the New York State Department of Mental Hygiene, with a recognized department of psychology.

This program is an extension of the intern training undertaken by the Research Department of Letchworth Village in 1935, and extended in 1939 to include other institutions. As now organized, there is offered to students an unusual opportunity for close contact with many types of clinical material, and for participation in clinical, educational, and research programs, in services whose staff membership includes psychiatrists, physicians, psychologists, teachers, social workers, and highly specialized investigators in other fields.

Two types of internships are offered: (A) one-year internships open only to applicants who hold an M.A. or M.S., or Ph.D. degree in psychology or who have completed one year (30 hours) of graduate work in psychology with at least one course in psychometric methods or its equivalent; and (B) two-year internships open to applicants who have completed undergraduate work, including some courses in psychology, at a recognized college or university, and who wish to combine an internship with graduate work leading to a Master's Degree at one of the New York Universities.

All interns will be expected to spend a minimum of eight months of the training period at one of the cooperating institutions, and will have exchange periods at other institutions. Such programs and the individual research projects will be planned only after the interests and maturity of the student have been ascertained.

Interns are expected to contribute to the clinical service of the institution to which they are assigned and their work will be under the direction of the following psychologists: DR. THEODORA ABEL at Letchworth Village; DR. ELAINE F. KINDER at Rockland State Hospital; MR. SCHACHNE ISSACS at New York State Training School for Boys at War-

wick. Miss ANGELA FOLSOM will supervise the training program, working directly with the interns and spending some time each month in each institution.

Intern appointments are usually made in January and July. The internship provides board, room, and laundry, but no stipend. Interns on two-year appointments will be given leave during the summer for summer session university courses. One or two graduate courses can be carried during the winter terms in addition to the institution service. Interns taking university courses are expected to make their own arrangements regarding university fees and expenses. Satisfactory completion of the intern training course meets the requirement for supervised clinical experience for certification as school psychologist by the New York State Education Department; the requirement for one year of paid experience in clinical psychology of the New York City Civil Service Commission; and the requirement for one year of clinical experience of the New York State Department of Civil Service. A maximum of ten appointments may be made for the coming year.

Application blanks may be secured by writing to Miss ANGELA FOLSOM, Psychology Division, Research Department, Letchworth Village, Thiells, New York.

Psychological Bulletin

SPEECH AND PERSONALITY

BY FILLMORE H. SANFORD

Harvard University

Language, traditionally, has been regarded as the "vehicle of thought," with the thought attracting far more attention than the vehicle. But there are those who object to the traditional distribution of attention on the ground that the vehicle as well as the freight it carries should be given systematic scrutiny. We will pave the way for a nomothetic science of language, they insist, only when we stop worrying exclusively about the thoughts expressed and lay hold on the linguistic reactions themselves.

The psychologist whose curiosity is chronically skewed toward problems in personality finds considerable promise in this new "objective-descriptive" approach to language. He senses that precise linguistic data may lead not only to the formulation of general linguistic laws but also to a greater understanding of the individual who uses language. Reacting in line with his persistent bias, he asks whether there are not individual differences in verbal behavior and whether such individual differences are not related to personal adjustment.

The present paper is concerned with the existence, consistency, and significance of individual differences in the mode of verbal expression. Its purpose is to review the relevant researches, to assay the fruitfulness of the general area of investigation, and to point out some pressing problems.

BACKGROUNDS

Before 1900, although they granted the importance of language, psychologists had little to say about linguistic phenomena. For a long time language was described as the "expression of ideas." Nothing more, according to the prevailing frame of reference, needed to be said. Nothing more *was* said until psychology escaped the long-lived incubus of dualism and subjectivism. Not until the advent of functionalism and, later, of behaviorism were

problems in language given a psychological formulation. The "functional-behavioral" view of language first appeared in the writings of Baldwin (7) and Cooley (27). Dewey (29), Mead (63, 64), and Bernard (13) enlarged upon the basic conception, while a more psychological flavor has been added by Allport (2), Lorimer (58), Markey (60), DeLaguna (28), and Latif (55). Language became behavior. It achieved status as the consummately human behavior of human beings. As such it became amenable to experimental investigation.

When psychologists came to view language in its behavioral and adjustmental context, they became more conscious of linguistic problems. In recent years, this consciousness has been sharpened through an increased *self*-consciousness in the use of language. The writings of Carnap (22), Bridgman (18), Bloomfield (14), Morris (68), and Stevens (90), dealing with language as an organon of the sciences, and the works of Ogden and Richards (73), Korzybski (52), Johnson (47), and others, treating the more limited semantical aspect of language, have had a noticeable effect upon psychologists. More and more of them are more and more concerned with the problems of verbal behavior. The bibliographical reviews of Esper (36), Adams and Powers (1), McCarthy (61), and McGranahan (62) demonstrate that a psychology of language is under construction.

Though largely nonexperimental, there is an extensive and growing psychological literature treating linguistic phenomena. Most of this literature is beyond the scope of the present paper, but there are two perceptible developments, within the larger area, which serve as a background for the problem of language and personality. The first development treats the functional relation between language and nonlinguistic behavior. The second is directed toward a quantitative description of linguistic phenomena themselves.

In connection with the first development there have been several experiments and many theories suggesting that language is intimately involved in nearly all mental processes and adaptations.

Mead's (64) notion is that linguistic activity is prerequisite to self-consciousness and the development of the Ego. Luria (59) has accounted for "will," or the functional barrier between stimulus and overt response, largely in terms of the individual's use of language. Lehmann (56), Casirer (25), and DeLaguna (28) have stressed the role of language in per-

ception. Warden (101) has demonstrated the important part that verbalization plays in the learning process; and Cason (24), Razran (79), and others have elaborated upon the role of language in human conditioning. Many writers have concerned themselves with the elusive relation between language and thought.

The second trend, that toward a quantitative analysis and description of linguistic events, is as yet making only a minor stir in the developing psychology of language. But there are several investigators who adhere to the conviction that we must have precise descriptions of the ways in which linguistic phenomena occur before we can have an adequate empirical psychology of language. We must escape the artificial classifications of the grammarians and devise methods of analysis which will make possible a *psychological* description of regularities, interconnections, and situational variations in linguistic phenomena.

Many of the studies in children's language, reviewed thoroughly by McCarthy (61) and in part by Young (105), contribute to this trend, but too often the light these researches might shed upon the psychology of language is obscured by a preoccupation with developmental norms. Zipf's (106) frequency-counts are a step toward a quantitative psychology of language, and Skinner (85, 86), Carroll (23), Chappell (26), and Boder (15) have given us indications that linguistic behavior is vulnerable to the quantitative attack. Johnson (48) has outlined a comprehensive program of research aimed at a quantitative science of language.

In short, the phenomena of human speech may some day be given a description and a classification rooted in the behavior of organisms rather than in the minds of armchair grammarians.

One modern emphasis is upon the functional significance of language in the life of the organism. Another trend of development shows that for the phenomena of language, at the descriptive level, a precise and analytical description is feasible. These two developments set the stage for the problem of speech and personality. The speech of the individual is involved in his daily adjustments, and the speech of the individual can be studied by methods straightforward and simple.

When Ben Jonson wrote, "Language most showeth a man; speak that I may see thee," he was epitomizing a notion more elaborately developed by Dewey (30), Sapir (83), Kantor (49), Elwood Murray (69), Pear (76), and others. All these writers stress the richness of the relation between speech and personality. Man, the sign-using animal, makes many of his adjustments by devices purely linguistic, and his intellectual functions are in large

part dependent upon words. If we set up the hypothesis that a study of the individual's verbal behavior will disclose a facet of his personality, it appears unlikely that we are weaving a rope entirely of sand.

The researches bearing upon this hypothesis will be treated below under the following headings: (1) Studies of Literary Style, (2) Types of Speech and Types of Thought, (3) The Language of the Child, (4) Semantics and the Individual, (5) Diagnostic Significance of Specific Linguistic Constructions: The Verb-Adjective Ratio, (6) Effective Speech and Effective Personality, (7) Speech in Psychopathology, (8) Voice and Personality, and (9) Disorders of Speech.

STUDIES OF LITERARY STYLE

The French have it that style is the man himself. There has been, however, little experimental work to implement this definition, either by the French or by others. Possibly this is due to the difficulty of defining style more precisely and to the conviction that style, however defined, is too subtle an aspect of behavior to submit to system and test.

Vernon (97), approaching at the level of impression the problem of written style, found that he could match, to a degree significantly greater than chance, the anonymous essays of his subjects with his impression of their personalities. These impressions he gained by observing the subjects for 45 minutes while they were occupied with various nonverbal tests.

Allport, Walker, and Lathers (3), "interested in the most highly generalized trait of an individual which seems to be expressed in his written production," found that anonymous themes of college students could be matched successfully with other themes from the same students. Working with nine themes from each of 70 students, collected over a period of eight months, the investigators attempted to group together all the themes written by each subject. The success of these matchings was computed by Vernon (97) in terms of a contingency coefficient of $.60 \pm .062$.

The investigators report that successful matchings could not be made on the basis of "mechanical carriers of style," but that it was necessary to make judgments concerning broad personal characteristics of the writer. They perceived "a certain common quality or characteristic which would transcend the particular topic and reveal the student." One student revealed tolerance and a sense of humor, another a pervasive self-consciousness, etc. The investigators maintain that the identifying characteristics of the themes are too elusive to be stated adequately in language. But in spite of this tendency to believe that style can be approached only through some manner of intuitive perception of its form-quality, the writ-

ers, in their reports of the actual process of judging themes, demonstrate that they did use such cues as simple, complex, involved, or loose sentences and details of organization and arrangement. Is it true, then, that style must be intuited? Or is there some chance for a more objective and statistical procedure?

Rickert (80) thinks that style can be studied in an analytical manner and proposes various techniques for such an approach. She analyzed the writings of various authors in terms of the "mechanical carriers" of style and found that such methods reveal marked stylistic differences among writers. She employed such categories as length, type, and distribution of sentences and the relative frequency of imagery, and found all of them diagnostic of individuality. However, Miss Rickert made no systematic study of consistency and made no attempt to connect style with the personality of the author. The interest centered around style *per se*. But the method may have possibilities for a thorough and psychological investigation of style.

Borchers (16), Barnard (9), and Runion (82) have made analyses of speech style employing methods similar to those suggested by Miss Rickert. Runion, whose studies may be taken as an example here, selected 50 speeches of Woodrow Wilson and made a quantitative study of sentence length, sentence structure, sentence "artistry" (loose, periodic, balanced), and figures of speech. The study proves the feasibility of a statistical approach to the study of individuality in expression, but the data have minimal significance for the psychological problem of style. The author, more than anything else, compared Wilson's technique to traditional rhetoric. With respect to all the variables employed, there was variation with the type of speech. For example, the mean sentence length in Wilson's after-dinner speeches was 34.16 while that for his sermons was 26.50 words—a statistically significant difference. And as we might expect, he uses more figures of speech in eulogistic and after-dinner speeches than in legislative addresses. These findings raise the interesting problem of situational determinants in linguistic behavior, but in themselves tell little about Wilson's style. There are few data which compare Wilson on one occasion with Wilson on another and none comparing Wilson with other speakers.

Further statistical studies of style have been carried out by Williams (104) and Wall (100). Williams evolved a measure of sentence length which he claims as a stable characteristic of an individual's literary style. Wall, by compiling the frequencies of such constructions as type of clause and passive voice in the German saga of *Wolfdietrich*, found that certain portions of the work demonstrated consistent syntactical traits of one author while other sections appeared to be written by an author with different traits. His findings agreed with existing notions concerning authorship of the saga.

The work of Vernon (97) and of Allport, Walker, and Lathers (3) has demonstrated that there is an individuality of written expression; that this individuality can be perceived by judges and matched successfully with impressions of the subjects; that various

samples of expression by the same individuals can be matched successfully with one another; and that judgments of style tend to be made on the basis of traits of the writer as they are revealed in the writing rather than on the basis of objective and mechanical cues. But Rickert (80), Runion (82), and others suggest that style can be studied and analyzed profitably in terms of various grammatical and lexical categories.

There is a controversy and a problem here. Can style be studied fruitfully in an objective, analytical and quantitative manner, or is there some inherent necessity for approaching it through intuitive judgment and high-order inference? Allport, Walker, and Lathers conclude that the most successful identifying marks are those general personality traits that show themselves in the writing of the individual. Undoubtedly these identifying marks are revealing. But the authors, having searched for no other marks, are not justified in concluding that these high-order traits are the *most* successful or the *only* successful identifying factors. Indeed, the judges demonstrate that they did rely on grammatical and lexical cues in arriving at their judgments. There appears little else to rely on. Uncomplicated sentence structure, for example, occurred in the themes of the person judged to be "direct and uncomplicated." Thus the "mechanical carriers" of style do enter into the judgments, but the judges do not study these cues systematically before making their inferences. Possibly a thorough statistical study of these cues will serve to fill out the lacunae in the inferential process, making it more retraceable, more precise, and more communicable.

There is, then, a reasonable argument, reinforced by some empirical evidence, that a quantitative analysis of written expression can discover individuality. It may well be, however, that there are subtle aspects of uniqueness in style which cannot be uncovered by analytical procedures. It is reasonable to expect that the sensitive observer can appreciate relationships and co-existences which escape objective analysis. The brain is a more subtle instrument than a calculating machine. We do not know how successfully the "down-to-earth" methods of analysis and computation can deal with style, but these methods cannot justifiably be discounted until they have been given a trial. This expected discrepancy between subjective impressions and objective data represents an important problem in connection with the study of many phases of personality. An attempt to "measure" style

might be expected to throw some light on this question. It would appear that language, because of its complexity and its apparent amenability to subtle quantification, recommends itself as a medium in which the analytical approach to individuality is likely to be most profitable.

TYPES OF SPEECH AND TYPES OF THOUGHT

Two German writers have suggestive things to say about speech and personality. Combining the familiar typological approach with what appears to be a typical Germanic sensitivity to linguistic problems, Krechel (53) gives us a characterological typology for speech, and Dieter (31), working with linguistic data, does the same for thought.

Krechel was interested in three major aspects of speech. These he designates as (1) *Spracherlebnis*, or the manner in which the individual understands or experiences words, (2) *Sprachgestaltung*, pertaining to the constructions and patterns employed in speech, and (3) *Sprechen*, the use of rhythm, intensity, and emphasis in the act of speaking. He collected samples of speech from a number of subjects, and, proceeding by what he describes as "eine verstehend-deskriptive und experimentelle Methode," he classified his subjects into three types, the *Egocentric*, the *Material*, and the *Selective*.

Each type of speaker, Krechel thinks, has a unified style, with all aspects of speech cohering in a personal pattern. The *Egocentric* speaker, for example, imposes idiosyncratic meanings upon words, chooses linguistic constructions more to express his *Ego* than to communicate with his auditor, and plays upon his voice as an instrument to impress himself upon all within earshot.

Krechel presents no data to support his typological delineations, and he fails to give much information about his method. Consequently his work leaves us somewhat unhappy. But if one steps into Krechel's shoes for the moment, backs away from questions of precise data and explicit procedure, and takes a global view of the issue, he will readily see that there are certain individuals who fall nicely into one of these types. There are also people who fall nicely into none of these types. Krechel makes keen observations of speech and people, and his categories may turn out to be basic dimensions of speech. Then again, his types may disintegrate completely in the face of empirical test. At any rate, the empirical test is called for.

Dieter's (31) work on types of thought shows a good deal of similarity to that of Krechel. Dieter maintains that each thought carries the stamp of the one who thinks it. He set out to investigate this stamp of individuality, since his is the faith that the ideational aspect of the person is of cardinal significance for the structure of personality.

Dieter collected and analyzed large numbers of school compositions and various samples of oral speech. On the basis of this material—or at

least with the aid of this material, for the typological investigator is not a slave to factual findings—Dieter defined two main types of thinkers.

The *Formalistic* type is anchored more in the abstract than in the concrete, is characterized by "distancing" and ordered procedure rather than egocentric and immediate. He is static and perseverative, repeating both form and content and demonstrating an inability to cover much territory in his thought. He imposes his will and logic upon phenomena, is addicted to causality, and his thought is possessed of continuity and closure.

The *Object-bound type* of thinker Dieter describes as being anchored in concrete life and as being egocentric or immediate where the *Formalistic* type is "distancing." He is associative rather than schematic, dynamic rather than static, and varied rather than perseverative.

Dieter presents quantitative data which indicate marked individual differences with respect to such dimensions of thought as repetitiveness or perseveration, "strictness" of organization, and the relative emphasis on causal, means-end, or motive-action relationships. But he gives no indication of the individual consistency here. This appears to be implicitly assumed. In several cases his typological lines do not follow the dictates of his data and hence have the appearance of arbitrariness. Despite these criticisms, however, this investigation is stimulating. The work strongly indicates that there are individual differences in this little-explored ideational realm and that these individual differences can be gotten at analytically.

Despite the fact that Dieter speaks of thought and Krechel speaks of speech, one is given to wonder if they are not working in essentially the same realm. They both observe linguistic behavior, with Krechel covering more aspects of this behavior than does Dieter. From speech Krechel infers personality; Dieter, thought types. There appears to be a striking similarity between the *Formalistic* type of thought which Dieter describes and the *Selective* type of speaker which Krechel describes. The *Selective* type of speaker is interested in ideas and ideational connections. The *Formalistic* type of thinker is rooted in the intellectual. The *Selective* speaker is characterized by his use of vague dimensions and rough sketches. The *Formalistic* thinker is "distancing." The *Selective* speaker sees the world as an ordered illustration of his ideas. The *Formalistic* thinker imposes his will and logic upon the outside world. The *Selective* speaker has a static, solemn style, lacking in picturesqueness. The *Formalistic* thinker is perseverative and static, intellectual and causal.

On this level of description, it is easy to conceive of the same individual doing this speaking and this "thinking." By listing all the descriptive phrases used by the two writers, one can, with a certain degree of subjective meaningfulness, group them all under Krechel's typological words and, with an equal amount of satisfaction, group them under Dieter's two types. This is almost tantamount to saying that "thought," as Dieter seems to view it, is one aspect of speech.

Taken together, the two pieces of work suggest that if the aspects of speech they describe were empirically examined, if reliable categories of analysis were used, and if individual consistency exists, we may discover "thought-speech" dimensions or traits or "general factors." The two researches propose categories which promise to bear fruit when quantitatively applied.

THE LANGUAGE OF THE CHILD

In 1931 McCarthy (61) listed 148 publications dealing with the language of the child, and since that time the rate of publications in this area has probably been accelerated. This literature adds up to two things: a method and a plethora of data. The data leave something to be desired, for the persistent concern for developmental norms and for data *qua* data surrounds much of the work with a theoretical vacuum. But the method is interesting. The quantitative study of childhood language is shown to be feasible. This method, applied to an orderly assortment of problems possessing conceptual unity, holds considerable promise for the psychology of language.

Not all researches in the child's language, however, can be accused of lacking theoretical implications. Piaget (77, 78) and Markey (60), among others, have brought system and sense into the great assortment of facts. Piaget's classical work relates language and thought to the process of socialization. Markey, traveling the same conceptual road, marshals miscellaneous facts to support the thesis that the "symbolic process"—language and thought—is produced and forged by the social environment.

"Speech reactions," Markey writes, "are primarily to be considered causally or functionally as a response to the total stimulus situation before the reagent" (p. 145). Thus, speech is behavior. It is behavior which serves as a direct tool of adjustment, and, more importantly, it is behavior entering indirectly into more overt and more obvious adaptive actions to complicate and delay, but

always, in the long run, to facilitate adjustment. Markey finds that the data from childhood language support such an interpretation. And his systematization of these data pave the way for hypotheses regarding the psychological significance of certain usages in the speech of adults.

To demonstrate the socialization of speech, Markey cites data showing that as more and more people insert themselves into his psychological world, the child employs more pronouns of the second and third person, fewer of the first person. The exodus from egocentrism, brought to pass by the social world, reflects itself in the child's speech. Hand in hand with this development, Markey asserts—and there are others who see eye to eye with him in this—there is a marked decrease in the frequency of "action" words. As the social world expands, the child is less concerned with the immediate personal use of things and becomes more involved with substances and abstractions. The Ego no longer lurks in every corner of the symbolic process.

There is reasonably good evidence that the advancing socialization of the child is accompanied not only by a decrease in first-personal pronouns in his speech but also by an increase of nouns and their adjectival qualifiers, while verbs and adverbs decrease in frequency. Since the child, untutored in the ways of grammar, may include all known parts of speech in a one-word sentence, there is an inherent danger in grammatical classification of his speech. But with an eye to this danger, we still are tempted to extrapolate to adult speech and ask whether the frequency of nouns, adjectives, verbs, adverbs, and pronouns may not be related to the degree of socialization in adults.

In this connection, the personal pronoun has received some attention. That the frequency of the first person singular is related to egocentrism is neither a new nor erudite notion, but such a relationship has never been thoroughly examined. Certainly we would expect to find individual differences in pronominal usage, and we would not be surprised if these individual differences correlated with the degree of what G. W. Allport (4) has called the "extension of the self." One man might talk half a day with his Ego remaining entirely dormant. Another, like the chronic gesticulator in a telephone booth, might find his conversation completely stalled if "I" and "my" were taken from his vocabulary.

Anderson⁵ (6) has made a study of pronouns in the themes of college students, revealing pronounced individual differences but no conclusive

evidence of individual consistency in pronominal habits. His low coefficients of consistency may be due to the fact that there is no consistency. A better guess, however, is that the apparent lack of consistency is due to (1) the smallness of the samples of speech, (2) the fact that any two samples from any one student may have represented responses to totally different psychological situations, or (3) the fact that these were written compositions; the painful deliberation involved in writing a college theme may yield less consistency and less "naturalness" than oral performances. A fourth possibility is that an invariant egocentrism of the individual is expressed in varying ways, only one of which, and maybe an unimportant one, is the use of first-personal pronouns. Each of these four hypotheses about Anderson's results is also a more general hypothesis regarding speech and personality. They apply to any single usage we might wish to study, and they present problems which can be experimentally attacked.

We can keep the hypothesis that personal pronouns are an index of egocentrism. And extrapolating again from children's speech, it is possible to reason that "action" words, adverbs, nouns, and adjectives are either positively or negatively correlated with first-personal pronouns and with egocentrism.

Another line of research, related to the foregoing, appears to be pertinent to general linguistic psychology and to the problem of individuality. It stems from Piaget (78) and his work with the phenomena of subordination. Piaget maintains that an increase in the frequency with which the concept of cause appears in speech goes hand in hand with increased socialization of the individual. The young child, being egocentric and unmindful of the auditor, feels no need to explain his judgments. His thoughts—and his speech—are direct and unselfconscious. He talks but does not communicate, juxtaposes but does not explain. As he comes in contact with the social world, he finds that he needs to justify his statements. He learns to anticipate questions or objections and to answer them in advance. Hand in hand with this need for justification goes an increased facility in, and frequency of, explanation.

... the need for checking and demonstration is not a spontaneous growth in the life of the individual; it is on the contrary a social product. Demonstration is the outcome of argument and the desire to convince (77, p. 15).

Only by means of friction against other minds, by means of exchange and opposition does thought come to be conscious of its own aims and tendencies, and only in this way is it obliged to relate what could till then remain juxtaposed (78, p. 11).

The more the child runs into this social friction, the more he

"thinks" and the more does he use the concept of causality in his speech. For him the use of "because" seems to indicate a need to justify his statements, a need to answer questions in advance. Proceeding from this conception to adult speech and arguing possibly more on the basis of analogy than logic, it is possible to set up the hypothesis that the frequency of the use of cause concepts in adult speech will be connected with the same need for justification. Or to phrase it differently, the hypothesis might stand that the frequency of "because" in adult discourse will correlate negatively with dominance. The overbearing, ascendant, self-confident individual, making dogmatic and unexplained statements, presents a consistent picture. At any rate, Piaget gives us an hypothesis concerning the functional significance of cause concepts in speech.

In further considering this notion, one is given to wonder whether all subordinate clauses do not serve a similar psychological function. Piaget speaks of subordination as replacing coördination or juxtaposition in the language of the developing child. The concept of cause may be an example of a wider tendency. It can be argued with some degree of reasonableness that all subordinate clauses are akin in function to the clauses of cause. They may represent justification, or the answering of questions before they are asked. Piaget's work at least does not contradict such an interpretation. And there is evidence that all subordinate clauses increase with age.

LaBrant (54) has demonstrated that the frequency of subordination increases with both chronological and mental age, and she gives us some indication that the individual's use of subordination is an invariant aspect of his speech. As socialization advances and the need for justification or explanation of statements is impressed upon the child, we can argue, he employs more subordinate clauses of all varieties.

Particularly does the noun clause lend itself to interpretation in terms of a need for justification or a need to avoid "going out on a limb" in verbal statements. As the speaker becomes more aware of his own fallibility, direct statements are replaced by more cautious indirections such as "it seems that," "I think that," "he said that," each expression being followed by a noun clause. This may be a developmental process culminating in the scientist's predilection for similar devices to avoid dogmatism, the impression of extremity, and personal accountability for his statements. It would be interesting to compare scientific writing with, say, novels,

in the frequency of these noun clauses and other devices which express limited certainty and limited commitment. This comparison would probably be very dramatic if doctoral dissertations were used as examples of scientific writing. We might expect that diffidence and uncertainty would be at a peak in such writing. On the other hand, it might be that diffidence before the truth has to be learned and that a little learning is a dangerous and dogmatic thing. At any rate, here are *a priori* grounds, slightly backed by data, for making the hypothesis that noun clauses have for the speaker the psychological function of indirection and demonstrate a tendency away from dogmatism. We also can make the hypothesis that such noun clauses will correlate with other statements of uncertainty or limitation such as "possibly," "perhaps," "maybe," "to some extent," and certain of the modal auxiliaries ("might," "could," "may").

It is interesting to note that the amount of subordination in the child's speech is positively correlated with intelligence only up to a certain age. LaBrant found a correlation of $+ .29$ for children, while Anderson found none in his work with college students. This suggests the possibility that, after the individual reaches his peak in intelligence, nonintellectual factors become more operative in determining his index of subordination. If we follow Piaget's general thesis, there are only secondary reasons for a relationship between intelligence and subordination. Mental age may be a factor only in so far as it facilitates the learning of a social lesson and helps in the formulation of an operative "generalized other." Possibly in adults we should expect a relationship between subordination and certain personality variables. The problem remains a problem.

Though the researches in the child's language have no immediate relevancy for the present problem, the data can be interpreted so that they furnish grounds for hypotheses regarding adult speech and adult personality. Young's (105) data pertaining to length of sentence and the various parts of speech might be given a treatment similar to that accorded here to pronouns and subordinate clauses.

SEMANTICS AND THE INDIVIDUAL

The recent concern with semantics or "word-fact relationships" has, among other things, raised the problem of individual differences in semantic habits and the psychological significance of "poor" semantic practices. Korzybski (52) has claimed that training in semantical self-consciousness has far-reaching effects on broad personal adjustments of the individual. Johnson (47) concurs in this notion and has presented an outline for a course in

"Remedial Semantics." Hayakawa (41) further develops the trend of thought in his analysis of "Language in Action."

The hypothesis, stated broadly, maintains that the individual who applies rigid Aristotelian class-words to a world which is not rigid and not Aristotelian will sooner or later run afoul of the inevitable misfit between his words and the world. If he reacts to the world of "dynamic process-reality" on the basis of static classifications, his adjustments will be inadequate, his predictions will prove erroneous, and his mental stability may be undermined. Concepts have a "fixing effect" when applied to "reality." If the person assumes an identification between these fixed words and a reality which refuses to be fixed, he runs into difficulty. Even dental caries, it has been claimed, may be produced by improper semantical practices (10, 11).

Writing on a more specific level, Korzybski has described the "attitude of allness" and the kind of person in which this attitude inheres. This "attitude of allness" refers to a tendency toward broad and invalid generalizations, the tendency to infer readily to "all" from "some." The individual who attempts to solve his problems on the basis of "dramatic instances" would be demonstrating this semantic attitude. He "abuses" the process of abstraction, identifies words and objects, and confuses high-order abstractions with low-order abstractions. Such individuals, Johnson (47) writes, "act *as if* knowing, say, a second-order verbal abstraction were the same as knowing the abstract (the first-order description) from which it has been abstracted" (p. 32). Johnson proceeds to a description of the personality which is claimed to occur in conjunction with this tendency toward identification and allness.

Armed with their highly verbal "knowledge," they assume attitudes of authority, become dogmatic, and then become very indignant, disappointed, hurt, even paranoid when contradicted or challenged. Persistently asking such a person, "What do you mean?" is an almost sure-fire way to get him angry.

Or, they act as if, knowing a description or "having a name for it," they know *all* there is to know, and they evolve theories, make plans, join clubs and start movements without bothering to examine the actualities they are presumably talking about.

Such identification and attitudes of allness as the above are characteristic of the "lunatic fringe," the "cranks," the "thirty-dollars-every-Thursdays," the "eighteen-day-dietists," and for that matter, the "die-hards" of every variety, whether die-hard Republicans or die-hard Trotskyites, or "blind" patriots, or the politicians who "believe now,

always have believed, and always will believe" whatever it is they believe. And along with them is to be classed the little six-year-old boy who "knows everything," with the qualification that for him to be "infantile" in this sense is to be relatively "normal" because of his tender age, and relatively undeveloped cerebral cortex (pp. 32-33).

The opposite to this "attitude of allness" is described by Korzybski as "conditionality of response." Remedial semantics is partly aimed at establishing in the individual this tendency toward conditionality, or precisely qualified and quantified responses, tentative conclusions, and an adequate degree of uncertainty—in short, teaching the "certainty of uncertainty."

Korzybski also places considerable emphasis on excessive bodily tensions as related to "bad" semantic habits and to personal adjustments. Whether hypertonicity produces "bad" semantics or vice versa is an unsolved problem, but this lack of relaxation is seen as occurring hand in hand with other symptoms of semantic disorders. Again we turn to Johnson (47), whose prose generally possesses greater clarity than that of Korzybski.

The tendency to show "undelayed" reactions is consistent, of course, with a condition of hypertonicity. We rather expect a "tense" individual to be "jumpy," "nervous," "irritable," "quick to take offense," etc., to show "hair trigger" reactions generally. It is the relatively relaxed individual whom we rather expect to be "thoughtful," patient, tolerant, to suspend judgment, to consider the many sides of a question, to be "collected" and unexcited in emergency, etc.

The general picture, then, of an individual's behavior in which we see evidence of identification, allness, hypertonicity and "undelayed" reactions, appearing together, is a "consistent" one with which we are familiar—although we may or may not have been accustomed to speaking of it in exactly these terms (p. 38).

These writers appear to assume that bad semantic habits produce a paranoid, jumpy, irascible, cranky personality. As they paint the picture, we can believe that there is a relation between the cart and the horse, but which is cart and which is horse is not yet settled. Bad semantical practices, picked up through a faulty education, may produce a certain sort of behavior. On the other hand, faulty semantics may be a symptom of paranoia, jumpiness, irascibility, crankiness, etc., with each of these ailments having its roots deep in psychic or temperamental subsoil. But before we worry too much about the direction of the relationship, the relationship itself is in line for close examination.

Johnson also suggests the relevancy of applying to the problem

of individuality what is known as the "type-token ratio." This is the ratio of the number of different words (types) to the total number of words (tokens) in a given passage. This function is recommended as a more dynamic and valid measure of vocabulary than simply ascertaining the number of words a person "knows" or can define. Johnson suggests that it may be used to indicate the "stimulation value" of any situation, that it will be found to correlate with intelligence, and that the ratio might serve as a measure of degree of frustration, or of disorientation. "The phenomena referred to as the 'one-track-mind,' or 'monomania,' should be amenable to quantitative treatment in terms of the type-token ratio" (p. 11).

Johnson also presents a review of various quantitative studies of verbal behavior. While these do not possess clear relevancy for the problem of individuality in linguistic usages, they do suggest the potential fruitfulness of examining speech behavior quantitatively. For instance, what is a sentence, psychologically conceived? And what are the situational determinants of its length and complexity? What factors determine quantitative verbal output? How does verbosity vary from individual to individual and from situation to situation? These are relatively simple problems, but ones which must be answered if we are to have an adequate psychology of language.

One of the interesting aspects of the general hypothesis that relates semantics and adjustment is the direct inference (not yet demonstrated as justifiable) from linguistic behavior to other behaviors of the individual. This relationship between verbal and nonverbal behavior is a vast *terra incognita*, but one in which explorations are being made at the present time. Once we view speech as behavior and escape the limitations of that dualistic notion that sees language as the "expression of ideas," the field promisingly lends itself to investigation. We may eventually gain a more incisive understanding of the psychological function of language and of the psychological nature of specific linguistic usages. As Dewey (29) pointed out 50 years ago, we know very little about the psychology of an adverb or a noun or any other part of speech. One approach to this problem, although an indirect one, is to find out what sort of individuals use what sort of language, and further, what linguistic usages, if any, tend to occur together in the same individual. We may know the adverb by the linguistic company it keeps.

DIAGNOSTIC SIGNIFICANCE OF SPECIFIC LINGUISTIC
CONSTRUCTIONS: THE VERB-ADJECTIVE RATIO

Now and again we hear the assertion that some particular habit of speech reveals a deep personal trait. We have already had a look at Korzybski's diagnosis of the person who uses many "all's" and "every's" and at the possible diagnostic significance of first-personal pronouns. There are other linguistic constructions, of the same order of complexity, that have been alleged to serve as key-holes through which we can get a peek at "inner" personality.

The psychoanalyst, in off-the-record conversation, may suggest that certain specific sounds in the individual's speech may have a symbolic and diagnostic significance. For instance, a predilection for the explosive *p* sound may indicate that the speaker is symbolically indulging in some manner of noxious emission upon his audience. Typesetters will observe that one author regularly uses more *p*'s or *m*'s than another. In view of the work on phonetic symbolism, we can conceive of an individual demonstrating a predisposition to use explosives, sibilants, fricatives, or "large" vowels, for instance, since the evidence tends to indicate that these sounds, as separate from their use as parts of meaningful words, have symbolic and possibly expressive significance. Along this line, Jespersen (46) suggests that the phonetic structure of a language reflects the characteristics of the people who speak it. English is a "masculine" language because, for one thing, so many of its words end in well-defined consonants. This contrasts with the soft, musical, vowel-dominated languages of Spain, Italy, and Hawaii. "You do not expect much vigor or energy in a people speaking such a language," he writes (p. 4).

But none of these hypotheses has been dignified by systematic examination. Markey (50) and Anderson (6) have made counts of the pronoun *I* but have not attempted to get at any relationship with personality. There have been researches, however, which indicate that more or less specific characteristics of speech are diagnostic of personal traits.

In 1925 Busemann (19, 20) presented evidence indicating that the relative frequency of verbs and adjectives is closely related to what he termed emotional stability. Recording in shorthand the narratives told by children of different ages on different subjects, Busemann counted the number of "qualitative" and "active" constructions. In the former category he included all adjectives, all participles used as adjectives, and all adjectival nouns. As "active" constructions he counted all verbs except the auxiliary. The Action Quotient (Aq) was derived by dividing the number of "active" expressions by the number of "qualitative" expressions. He found that the Aq varied for a given child from year to year

and that a relative increase in the number of verbs was accompanied by an increase in emotional instability as rated by teachers. Of 26 children who demonstrated changed Aq's, those who showed a higher quotient were rated as more unstable and those who had a lower quotient as more stable than at the time of last testing. The ratings by the teachers showed no change for the four whose Aq's were unchanged.

Stern (89), commenting on Busemann's work, writes:

Busemann is right when he speaks of an "active" and a "qualitative" style: he gives the interesting proof that these "style" differences depend very little upon the subject-matter dealt with. The "actionale" person will express himself in the description of a landscape in "active" terms,—whereas the individual with a "qualitative" style will dwell even in reports of travel upon the description of more quiet impressions. The active style correlates more closely with mobility and emotions, with lower objectivity, less concreteness and less intellectuality. The qualitative style reflects the opposite traits. Evidently we have here a distinction similar to that which differential psychology long ago designated as "subjective" and "objective" types.

Balken and Masserman (8) used Busemann's Verb-Adjective Ratio in investigating the relationship between speech and types of emotional disorder. They found that this measure clearly differentiated among the three types of disorder they observed. Conversion hysterics, who are described as superficially placid and free from emotional stress, use many adjectives. The anxiety hysterics, less emotionally stable, use relatively many verbs. The obsessive-compulsive patients fall between these two extremes. These data serve to substantiate Busemann's results.

Boder (15) has pointed out a similarity between Busemann's two dimensions of speech style and Rorschach's (12) distinction between kinaesthetic and color responses in the ink-blot situation. Many kinaesthetic (verb) responses, Rorschach maintains, are made by the individual with sluggish motility, an introverted nature, and little adaptation to reality. A preponderance of color (qualitative) responses reflects the excited, alertly motile, extraverted individual with a better adaptation to reality.

It may well be that Busemann and Rorschach are dealing with much the same thing here. It might be expected that the individual who injects action into an ink blot will make a similar injection into the scenes and situations which he verbally depicts. But neither the individual who makes kinaesthetic responses to ink-blot nor the person who uses many verbs in his speech is described with enough precision to enable us to make the argument that an analysis of the mode of verbal expression is potentially as revealing and as psychodiagnostic as the ink-blot technique. Where speech is produced in response to an amorphous stimulus, it does not seem unreasonable to expect that the speaker imposes his individuality upon his speech and reveals himself in his speech just as definitely and just as richly as he does in responding to the

Rorschach stimuli. The work of Busemann and that of Balken and Masserman lend some empirical backing to such a position. But as yet we have no satisfactory evidence that individuals do differ in their use of these formal variables in speech nor that these differences, if any, are consistent differences. And there are data pertaining to only a very few of the many grammatical and psychogrammatical aspects of speech. There is no good reason why the use of verbs and adjectives should be any more psychologically meaningful than the use of nouns or of such constructions as subordinate clauses, abstract words, metaphors, similes, possessives, superlatives, copulas, passives, or modal auxiliaries, to mention only a few of the possible categories of analysis.

Boder (15), following up the work of Busemann, has made an extensive count of verbs and adjectives in various American writings. Employing categories slightly different from the original ones used by Busemann, and working with an Adjective-Verb Quotient (Avq) derived by calculating the number of adjectives per 100 verbs appearing in the text, Boder analyzed 388 specimens of writing of widely different types in the attempt to examine the Avq (1) as it varied in the writings of the same individual, (2) as it varied from individual to individual, and (3) as it varied from one type of writing to another.

The data on the first two points are relevant in the present connection, but Boder did not arrange his findings so as to give a very complete picture of individual differences or of individual consistency.

In one part of his project, Boder analyzed many samples of speech from Emerson's *Journal*, from Mencken's articles in the *American Mercury*, and from Brisbane's syndicated column "Today." For each of these writers the Adjective-Verb Quotient varied over a wide range, and the range for the three appeared to be almost the same.

Taken at their face value, these data indicate a marked lack of consistency. But before we can decide about the degree of consistency we would have to know more about the types of writing these men were doing. In this connection it is necessary to apply the distinction made by Allport (4) and others between the *expressive* and *adaptive* aspects of behavior. If Emerson were writing a scientific description, his task would be appreciably different from his task in writing leisurely essays. Boder has shown that the Avq for scientific writing is, on the average, twice that for fiction. Before we can compare the verbal behavior of Emerson with that of Mencken or Brisbane, we need to hold constant the tasks or the

adaptive aspects of the behavior. If we assume that Emerson in the course of years of *Journal* entries did as much "scientific" writing as did Mencken, then we can conclude that Emerson has a more "active" style than Mencken (in so far as a lower Avq indicates an active style). Before we can compare absolute measures of the manner in which individuals write, we need to control the adaptive aspects of the situation in which they are writing. Comparing the Avq of Emerson's exposition with that of Mencken's narration is roughly similar to comparing the absolute area of Emerson's script with the absolute length of Brisbane's stride.

Boder does not attempt to connect the adjective quotients of these writers with their emotional stability. If he had looked into this relationship, it is doubtful that he would have verified Busemann's findings. Aside from a difference in categories, Boder worked solely with written material, while Busemann based his calculations on stenographic records of oral material. It is probable that this spoken material is a richer field for psychodiagnostics. The style of professional writers is likely to be highly planned and deliberate. Spontaneous speech is more likely to tap the "natural" behavior of the individual. Klages (50) has made the point that, in matters of expression, men reveal themselves most at unawares.

From the researches of Busemann and of Balken and Masserman we can conclude that there is some manner of relationship between the individual's use of verbs and adjectives and "deeper" aspects of his personal adjustment. Boder's work neither confirms nor contradicts in any definite way this general conclusion. However, from what may be called a "psychogrammatical" point of view, the categories used by these researchers are relatively blunt analytical instruments and do not give any but a gross picture of this aspect of speech or style.

Busemann included in his "qualitative" category all adjectives of any sort. Boder included only attributive adjectives, eliminating all appositives, predicatives, nouns used as adjectives, and adjectival participles. Both Boder and Busemann counted all verbs except the auxiliaries. Within each of these broad grammatical categories, verbs and adjectives, there are linguistic usages which, upon psychological grounds, differ from one another almost as definitely as adjectives differ from verbs. For instance, the demonstrative and quantitative adjectives such as *this*, *that*, *four*, and *tenth* are not very similar in function to ordinary restrictive

adjectives such as *oblong*, *flat*, *green*, and *grassy*. These in turn appear to differ from the more subjective judgments *stupid*, *beautiful*, and *terrific*. Again, attributive adjectives (those placed before the noun) seem appreciably different in psychological function from predicate adjectives. The expressions *the red house* and *the house is red* represent a different emphasis on the adjective. Participial adjectives, e.g. *the running boy*, often appear more active than qualitative. Boder seemed to recognize these internal differentiations when he modified Busemann's *qualitative* category. The *active* category can be broken down in much the same manner. Some refinement of the gross categories of verbs and adjectives seems likely to yield more incisive results, for it is logical to expect the "qualitative" individual to use the less active verbs while the "active" individual may use the more active or kinaesthetic verbs.

If the investigation of the linguistic side of personality is going to amount to a great deal, the problem of choosing and defining significant variables must be met and solved. Grammatical categories are available, but they are not psychologically conceived and may not be of maximal use in the psychological study of language. For one thing, there is great difficulty in fitting everyday speech into grammatical rubrics which were tailored to fit formal prose. For another, the grammatical category, as is possibly the case with adjectives and verbs, may include constructions which, psychologically conceived, are of a different and maybe an incompatible nature. Researchers have shown that the grammatical categories are useful in the study of individuality in speech. But there is no evidence that they are the most useful categories or that a better way of classifying linguistic phenomena cannot be found.

EFFECTIVE SPEECH AND EFFECTIVE PERSONALITY

In recent years, with the increased availability and popularity of psychological tests, many speech clinicians and teachers have been using these tests as instruments for determining the personality traits which characterize "good" and "poor" public speakers.

Tracy (96) subjected a selected group of mature actors and public speakers to a battery of tests consisting of the Otis Self-Administering Test of Mental Ability, the Bernreuter Personality Inventory, and the Allport-Vernon Scale of Values. The public speakers, both men and women, were significantly above average in intelligence, extraversion, self-sufficiency, dominance, and in social, political, and religious values. They were average in theoretical interests, below average in economic and aesthetic interests, and below average in neurotic tendency.

Murray (69) selected from among his students 25 "poor" speech personalities and 25 "developed" speech personalities. To these he gave the Bernreuter Inventory. The "developed" speakers averaged 98 ± 7.14 points higher than the "poor" speakers in self-sufficiency (raw scores) 92.4 ± 5.77 points higher in extraversion, and 134.8 ± 8.14 points higher in dominance. These are striking differences. But the data have only secondary psychological value in the absence of accurate description of "good" and "poor" speech. Murray does describe the poor speaker, but not without a marked dependence upon subjectivity. The psychologist is more interested in what speakers actually do than in how good or how poor they are.

Moore (66), Evans (37), and Jenks (45) have suggested that speech training can be a valuable therapeutic measure in treating personality maladjustment. Moore gave the Bernreuter Inventory to 61 students at the beginning and at the end of a college course. The course consisted of vocal exercises, oral interpretations, dramatics, debating, and "special speech mental hygiene procedures." Upon retest, the class averaged 30.41 ± 6.93 points (raw scores) higher in self-sufficiency, 26.09 ± 5.7 points higher in extraversion, and 47.95 ± 7.85 points higher in dominance. A control group upon retest showed no significant change on either of the three variables.

Before evaluating these results, we would have to know how much the students were trained in speech and how much they were trained in making more socially acceptable scores on the Bernreuter Inventory.

Hunter (44) approached the relationship between test scores and effective speaking by first selecting the personalities and then observing their speech. Two hundred high school students were given the Bernreuter Inventory. The 27 most introverted and the 28 most extraverted were selected for observation. These 55 students were given a spontaneous speech test wherein they described or talked about a picture of a flag-draped American eagle and were required to read a narrative paragraph of 213 words. Their performance was rated by the experimenter according to such standards as poise, emotional responsiveness, gesture, vocal variety, vocabulary, organization, etc.

The author reports that extraverts were extremely good or extremely poor speakers. The introverts were likely to be less variable and less extreme. There were more inferior extraverts than introverts, but extraverts who were good speakers were more proficient than the most proficient introverts. In reading, the extraverts made fewer errors in accent; fewer omissions, and fewer substitutions of sounds, completing the passage more speedily than the introverts. In spontaneous speaking, the extraverts are described as speaking longer and using more irrelevant words than the introverts. The author gives no quantitative data. His findings have to be reservedly considered.

Knower (51) reports that "the superior speaker" shows a greater tendency to ignore or remain indifferent to the personal element involved in reaction to a speaker. This evidence tends to support the contention that one quality of the superior speaker is the tendency to speak with 'abandon'. This observation is helpful in getting a psychological notion of what constitutes "good" public speaking.

These researches, though they are not as psychological as we might wish and though they are subject to methodological criticisms, do tend to indicate an intimate relation between the speech of the individual and his broader social adjustments. We would expect this to be so when we consider the number of our social contacts that are mediated and facilitated by speech.

The correlations between "effective" speaking and the various personality traits do not have material meaningfulness because there is no adequate description of what constitutes "effective" speaking. One gets the vague picture of a "good" speech as verbal response which is facile, well-coördinated, unselfconscious, proceeding "with abandon." Poor speech is halting, uncoördinated, self-conscious, and, one is tempted to say, complex. For where the description of the good speech is compounded with a description of a good speaker, one gets a picture of an outgoing, reactive, "man-of-action" organism, giving vent to behavior which is fluent, plentiful, well-coördinated, but involving few complex associative ramifications. This general sort of picture possesses some similarity to Korzybski's description of that attitude of allness and non-conditionality of response.

It appears that the "successful" public speech is one which *impresses* the auditor more than it *communicates* with him, one that stimulates autonomic rather than cerebral activity. The common auditor, it appears, does not care to empathize with the halting and self-conscious speaker or to exert any effort to understand the "thoughtful" speaker. He prefers to be gently stroked with pleasing sounds or to be towed about in an amorphous sea of affect. Possibly the speaker who keeps his auditors away from unpleasant empathy and does not involve them in effortful implications is the dominant, extraverted, untheoretical, unaesthetic, and—again—the "uncomplicated" individual. It is interesting to compare this picture of the "good" speaker with Boring's (17) recommendation for the scientific communicator, that he always be conscious of, and altruistic toward, his audience. H. G. Wells (102), in describing his own public-speaking demeanor, gives an example of the "intellectual" man's style of speech.

... speaking haltingly on the verge of the inaudible, addressing my tie through a cascade moustache that was no sort of help at all, correcting myself as though I were a manuscript under treatment, making ill-judged departures into parenthesis ... (p. 565).

One suspects that good speaking and effective communication are different phenomena. The patient who demonstrates the manic

syndrome is probably a more proficient speaker than the scientist who sees many implications and qualifications and who is self-conscious about his semantics.

Such considerations, and the possibility of setting up experimental problems in this area, are of decided interest, particularly now that we are so concerned with the techniques by which the public can be influenced, but the present paper can only point hurriedly and proceed along its main course.

SPEECH IN PSYCHOPATHOLOGY

In 1916 Southard (87, 88) made the suggestion that standard grammatical terminology may be used in describing psychopathological conditions, often with more descriptive adequacy than that yielded by existing psychiatric language. The patient's subjective relationship with his environment, Southard suggests, can be clearly depicted in terms of grammatical mood, voice, etc. He does not proceed to an investigation of the actual speech of his patients or suggest that such a study be made, but there is the implication that grammatical categories are psychologically meaningful and, since "thought and language are so largely identical in mechanism," the language of the individual should reflect his general adjustment.

It has been observed frequently that the various pathological syndromes have characteristic verbal behavior, and this behavior has been used in classifying cases.

Several writers have been somewhat more than casual in observing the speech reactions of familiar syndromes. White (103), Stockert (91), Teulie (94), Swift (92), Gruble (40), and Zipf (106) have written concerning these phenomena. Eisenson (33) summarizes these observations, presenting a general description of the verbal behavior of manics, depressives, and schizophrenics. The manic is described as talking incessantly and rapidly. His style tends to be telegraphic, and the rapid tempo of his speech often produces faulty pronunciation. He pays little attention to the auditor, flitting from one topic to another and omitting many connective constructions. The depressed patient talks as if all speech were an unwelcome and burdensome chore. He exhibits little diversification of tempo, voice, or subject matter, proceeding slowly and with monotony. He is complete and repetitive where the manic is telegraphic and diversified. The schizophrenic speaks with a consummate scorn for the auditor, employing neologisms and disarranged speech forms. His meanings are often purely idiosyncratic. His speech is colorful but often unintelligible. He fails to cover the ground the manic does and demonstrates less variety in form and content. His speech is of a low order of abstraction, though, White (103) points out, he uses abstract terms for concrete refer-

ents. He may demonstrate his scorn for the auditor by refusing to speak at all.

From these descriptions we get the general impression that the speech of the psychotic is at least roughly consistent with the rest of his behavior. Eisenson (33) is led to remark that "a disorder in the use of speech of any type or degree reveals a disorder in personality" (p. 166), and further, "we should realize . . . that any personality change, and any appreciable deviation from the norm in the mentality of an individual, will be reflected in his speech" (p. 190).

Newman and Mather (72), dissatisfied with these general descriptions of the speech of psychopaths, made a somewhat more analytical observation of the phenomena involved. The speech of patients was phonographically recorded as they read certain selections and as they spoke spontaneously. These samples of speech were checked against a schedule which included items pertaining to pitch, emphasis, articulatory movements, tempo, syntactical factors, length of response, etc. The three pathological syndromes described as *classical depression*, *state of dissatisfaction and self-pity*, and the *classical manic state* were shown to be clearly differentiated on the basis of the variables observed. The results are not at variance with the descriptions given by previous writers, and where there is coincidence of nosology, the picture is more complete than that given in casual and molar observations.

In a conclusion to their study these authors state: "Except in a purely formal sense, speech is not a self-contained category of behavior. Together with other behavioral forms it provides external symbols of human functioning, and one can therefore expect and find relations between speech and other modes of behavior."

In a further study of the "relation between speech and other modes of behavior" Newman (71) observed over a period of time written compositions of one girl and reported that states which he described as vague confusion, violent defiance, and calm reaction to conflicts are revealed in the language of the subject. Such categories as contrasts, degree concepts, sentence structure, superlatives, interrogations, "shock-words," and conventionality of punctuation were employed for the analysis, and the changing emotional states of the subject were seen reflected in these linguistic usages. The author does not present any concrete data to back up his conclusions, but his discussion of the case is provocative and convincing. In connection with the potential value of the study of verbal individuality, Newman writes: "Language is merely one form of culturally defined behavior that takes place in the context of human interaction. As such it fulfills multiple functions. In language behavior we must be prepared to find symbolic manifestations of the same kind of human functioning displayed in other areas of behavior" (p. 178).

We can conclude that major aberrations of personality are reflected in verbal behavior. But we still have no precise and complete picture of the speech of abnormal subjects. The area recommends itself for further investigation, for, as has been the case in much of psychology, a study of the abnormal may contribute to an

understanding of the normal. The study of psychopathological speech may be one fruitful approach to a general psychology of language and, more specifically, to an understanding of linguistic usage as it is related to other modes of behavior in the specific individual.

Proceeding further toward an objective and analytical study of psychopathological language, Balken and Masserman (8) worked with the speech of patients which they classified as *conversion hysterics*, *anxiety hysterics*, and *compulsive-obsessive neurotics*. They selected 15 patients of uniform intelligence (IQ, 118-138), 5 of whom were judged to fall into each of the above three categories. Twenty Thematic Apperception stories were told by each subject, recorded verbatim, and subjected to frequency-counts with respect to certain "psychogrammatical" categories.

The authors report that the three syndromes are clearly and statistically differentiated with respect to the variables employed. For example, the conversion hysteric, who has achieved a superficial emotional placidity, tells stories involving a plethora of leisurely material, using many adjectives, few verbs, little alternation, little qualification of statement, etc. In anxiety hysteria, on the other hand, the phantasies are brief and dramatic. There are many verbs, few adjectives, many alternatives, and many expressions of vagueness and uncertainty.

Taken all together, observations and experiments upon the speech of abnormal individuals demonstrate that abnormality of adjustment is revealed in linguistic behavior and that more or less specific syndromes are accompanied by more or less characteristic speech usages. The detailed description of the speech of the various types of disorders is by no means complete, but Newman and Mather suggest one fruitful approach, and Balken and Masserman propose another. The latter appears particularly promising because of the greater possibilities of objectivity and quantification. The Thematic Apperception technique (67) has shown how revealing is the content of phantasy productions; now we have indications that the formal aspect of utterance also has psychological significance. With both form and content yielding meaningful data, an adequate sample of speech may be an impressively economical and revealing source of information about the individual. Diagnosis is based upon the observation of behavior and inference therefrom to "inner" characteristics. If speech is looked upon as behavior and if speech can be objectively and quantitatively treated, then observation can be more precise and inference more incisive. Such diagnostic use of speech, though it does not appear beyond the realm of ultimate possibility, is many experiments

removed from realization. If we take the foregoing research at its minimal value, it at least recommends further investigation, and, more specifically, suggests again the fruitfulness of quantitative analysis of verbal expression.

VOICE AND PERSONALITY

Since Pear's (75) pioneer experiments there have been several researches upon the relation between voice and personality, all pointing to the fact that personality gets into the voice and can be perceived there by sensitive judges.

Rieffert (81), believing such dimensions of voice as melody, rhythm, pitch, tempo, etc. to be expressive of temperamental traits, has devised a characterological typology of *Sprechweisen*. Herzog (42), Taylor (93), Cantril and Allport (21), and Fay and Middleton (38, 39) have approached the problem experimentally. Of these studies, that of Cantril and Allport is the most comprehensive. Employing the matching technique, these authors found that judges, upon hearing the voice of a speaker, could, with considerable accuracy, make statements concerning physical and psychological traits of the individual. The more highly organized psychological traits were judged more successfully than physical features and superficial characteristics. All along the line the accuracy of judgments exceeded chance, but these authors found, as did Pear and Taylor, that the agreement among the judges was often greater than the accuracy, due to the presence of judgmental stereotypes.

Downey (32), Wagoner and Downey (99), and Wagoner (98) have indicated a relation between temperament and the rhythm, tempo, etc. of vocalization. Wagoner stated the principle thesis here as follows: "The intimate relation between vocalization and temperament finds expression not only in the quality of the voice but also in the mode and speed of articulation. That idiosyncrasies of speech are directly related to emotional states is so commonly acknowledged as to be an important factor in 'sizing up' a new acquaintance or a prospective employer" (p. 237).

The individual who speaks rapidly and with great impulsion is described as performing other acts in much the same manner, and the individual who speaks with great deliberation or hesitancy is, in nonverbal behavior, low on speed of movement, slow in making decisions, low on motor impulsion and finality of judgment, and has great interest in detail.

These conclusions were based on results from the Will-Temperament test. But since neither Downey nor Wagoner gave much thought to reliability or validity in their measurements, their observations cannot be taken as conclusive. Common experience, however, verifies a relationship between temperament and these motor aspects of speech.

We can conclude that certain aspects of personality are expressed in the voice. So far, this phenomenon has been studied

mainly at the level of impression. Judges can sense personality in the voice and can decide which voice "belongs" with which traits. One wonders whether this connection is of the sort that must be sensed by judges or whether it can ever be analyzed and stated in a quantitative manner.

Metfessel (65) and Tiffin (95) have devised apparatus and techniques for recording voice in such a way that the factors of pitch, intensity, and time can be measured precisely. These techniques have been used widely in the study of "good" and "poor" speaking. Murray and Tiffin (70) describe no less than 12 sensitive measures of voice. Lewis and Tiffin (57) have used these measures in the study of individual voices, but they were interested in what constitutes a good voice rather than in the relation between the various dimensions of voice and the various dimensions of personality.

The new phonophotographic and strobophotographic techniques possibly ought to be turned upon the problem of voice and personality. There is always the possibility, however, that the connection between the personality and the expression will be lost in "hard-headed" analysis. The early psychological investigations of handwriting and personality (43) revealed no impressive correlations between molecular, but measurable, variables and any personal traits. The work of Allport and Vernon (5), carried out at a more molar level, shows that handwriting and personality are connected. Early studies (74) conclusively showed that physique and personality have very little to do with one another. Sheldon (84), employing new variables and a new approach, tells us convincingly that physique and personality are intimately related. The history of these two problems appears to demonstrate how an unhappy choice of variables can obscure or even obliterate relationships. With respect to voice and personality, we can start with the evidence that they are related. The analytical approach, if judiciously employed, may clarify the relationship. If such an approach reveals no relationship, we would be forced to conclude that it may be the fault of the approach.

DISORDERS OF SPEECH

Just as insanity attracts more attention than sanity, disorders of speech have been studied more intensively than normal linguistic phenomena. While it is impracticable here even to scan the literature dealing with disorders of speech, it is worth while to point out that researchers are almost unanimous in insisting that linguistic disorders, especially stuttering, are closely related with

broad aspects of personal adjustment. There is no unanimity, however, as to what the relation is. In connection with stuttering, there are those who insist that the malady is produced by some disorder of personality, while others are equally sure that any concomitant personal maladjustment merely follows in the wake of stuttering. The whole literature pertaining to this disorder is contradictory and difficult. One is given to wonder if some of the verve that has gone into the investigation of stuttering might not have been better spent upon the less dramatic, but potentially significant, "roughnesses" that occur in normal speech. A study of the repetitions, rephrasings, and hesitations of everyday speech might well throw light upon stuttering and, in addition, contribute to our knowledge of normal linguistic behavior.

Eisenson and Pastel (35) have demonstrated that stutterers are unable to adjust rapidly to changing stimuli. The past reaction, through perseveration, tends to clutter up the new adaptation. Also Eisenson (34) has shown that stutterers, while more "talkative" than normal children, have marked difficulty in organizing their "thoughts" into coördinated discourse. The present writer, in an experiment now in progress, has marshaled data which indicate that normal "roughnesses" of speech are related both to perseveration and the inability to organize or arrange words into precisely concatenated sentences and paragraphs. The individuals who repeat words or phrases also "revise" or rephrase frequently, and their speech is characterized by many hesitating sounds ("uh" or "er"). There are indications that these speakers do not demonstrate a large diversity of subject matter or vocabulary and that they face a large number of complicating "choice points" in getting from one end of a sentence to the other. Instead of giving verbal responses in a smoothly concatenated chain, these speakers tend to pause frequently, to repeat a previous word or phrase, to make a tentative response and then rephrase it, and frequently to say "uh" while one of several potential responses gets the upper hand. The hesitating sound appears to indicate complexity more than it does a vacuum.

These preliminary results suggest that the "roughnesses" of normal speech are cousins to the phenomena of stuttering. There is the hint that a study of these "roughnesses" may reveal important intellectual or ideational traits of the individual. Also there is the possibility of a counterpart in nonverbal behavior. One wonders if the stutterer stutters in the performance of a complicated manual task.

SUMMARY

An empirical psychology of language is coming into existence. One branch of this development is the problem and the fact of a

relation between linguistic behavior and personal adjustment. There are many indications that language is a vehicle of personality as well as of thought, for when the person speaks, he tells us not only about the world but also, through both form and content, about himself.

Investigators of literary style, employing the matching technique, have demonstrated that the man is in his style and can be seen there by sensitive observers. Other workers, coming to the problem on a more molecular level, have found individuality in the lexical and syntactical carriers of style. Implicit in the latter studies is the notion that a close scrutiny of the cues involved in the judgments of style may bring style out of the clouds and down to a plane where we can treat it in terms of precise and communicable data.

Sustaining and documenting the notion that language bears importantly upon personality is the evidence that mental disorders are mirrored in speech, that effective speech goes hand in hand with effective personality, that the nature of the individual's semantic habits determines (or reflects) the nature of his adjustment, and that disorders of speech are tied up with disorders of personality. On a more specific level, there is evidence of a relation between emotional stability and the verb-adjective ratio. Other "psychogrammatical" variables appear to be involved with more or less specific traits of personality, and further, there is reason to believe that such constructions as subordinate clauses, abstract nouns, personal pronouns, etc. have correlates in personality. All along the line there are data, reasonable arguments, insights, and hunches, adding up to the conviction that by his words a man may be known.

We can accept it as a fact that speech and personality are related. But before we can get to the bottom of this relation there are many bridges to cross. The problems are still more numerous than the facts. Besides the many problems regarding the personal significance of specific linguistic constructions, there are other, and probably more fundamental, questions to be settled. We can list a few. What sort of variables can be used most profitably in the analysis of speech? The grammarians give us a multitude of analytical categories, but this may not be much of a gift, for the grammatical rubrics are of untried objectivity and may be of limited psychological significance. Is the individuality of speech too delicate a thing to submit to quantification and analysis? Will statis-

tics blur and obscure personality, or bring it out into the open where we can come to grips with it? What sort of speech should we study if we are hunting for personality; does the individual reveal himself more in written or oral language? In any sample of speech, how much of the response is attributable to the stimulus situation and how much to "personal" determinants? Must we remain on the level of specific variables and specific correlations, or are there general factors and broad dimensions of linguistic individuality?

These problems can be solved by experiment. It is not too far-fetched to suppose that their solution will lead into a new and profitable way of making predictions about the individual.

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ATTITUDES TOWARD WAR

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INTRODUCTION

At the close of World War I the desire for peace was great and hence there was much wishful thinking. Many believed that war had finally been discarded as a means of settling international disputes and that it had been forever banished. This appeared to be a logical belief because the slogan on their lips for more than a year had been "A war to end war." In view of this prevailing attitude, it would have seemed absurd to interrogate people concerning their attitudes toward war. Hence it is not until the middle of the lush twenties that we discover some interest in the attitude toward war, and not until the late thirties that studies come in any volume.

No doubt, there are many factors that aroused social scientists to an interest in war attitudes. In passing, we shall mention but a few of the more general ones. The first clash between China and Japan in the twenties clearly indicated that war had not been completely discarded in all parts of the world. Mussolini's aggression in Ethiopia, that came somewhat later, further jolted, however slightly, our complacent faith in permanent peace. War again became a reality, with renewed interest in attitudes toward it. A marked surge in this interest is noted around the period of the Munich conferences, and another with the actual outbreak of World War II.

Aside from these world events that undoubtedly led to the examination of war attitudes, we find another factor, namely, the so-called militarist-pacifist controversy that centered around voluntary and compulsory military training in high schools and particularly in colleges and universities. The one group maintained that military training fostered a favorable attitude toward war, while their opponents maintained with equal vigor that such training accomplished the very opposite. This dispute was, as we shall see, the impetus for several of the studies considered here.

The purpose of the present article is two-fold: first, to present a summary of the various studies dealing with attitudes toward war exclusive of Public Opinion Polls; and second, to indicate the general trend of the thinking and the evaluation of such data as these studies present.

PERIODS OF TESTING

The studies of attitudes toward war may be divided into three temporal groups according to the logic of world events. First, there are those that belong to the "pre-war" period (before September 1, 1939); second, those that belong to the period known as the "phony-war" (September 1, 1939 to May 9, 1940), and third, those that belong to the period after the invasion of the low countries or the "post-invasion" period (May 10, 1940 to December 7, 1941). Since the data reported in the articles listed here were collected before the entrance of the United States into the war, we may place December 7, 1941 as the terminal date for the third period.

Because the "pre-war" period covers several years, a rather long list of articles appeared in this period, most of which belong to the latter part of the period. Those belonging to this period are: Carlson (2), Corey (3), Droba (6, 7, 8), Dudycha (10, 11), Duffy (12), Farnsworth (14), Ferguson (15), Fromme (16), Gristle (18), Jones and Jones (21), Jones, V. (22, 23), Koga (26), Porter (30), Rogers (31), Smith (32), and Zubin and Gristle (35). Data were collected during the eight-month period of the "phony war" by: Barkley (1), Doob (5), Droste and Seyfert (9), Dudycha (10, 11), Johnson (20), Jones, V. (23), probably Kuhlen (27), and Middleton and Fay (28, 29). Those collecting data during the "post-invasion" period are: Dudycha (11), Erickson (13), Ferguson (15), Gilliland and Katsoff (17), Hartmann (19), Jones, V. (23, 24), and Katsoff and Gilliland (25). Since the exact time when data were collected for several of the studies is in doubt, the exact period to which they should be assigned is a question. These are: Day and Quackenbush (4), T'an (33), and Whisler (34), all of which were published in 1940. Since the publication date is usually one to two years after the date when the data are collected, we have some idea of the period to which they belong.

SUBJECTS QUESTIONED

In only two of the reports included here were adults, not in academic seclusion, questioned or tested. These reports were made by Droste and Seyfert (9) and Fromme (16). For obvious reasons most of the investigators used college or university students as subjects. Consequently the present summary is by and large a report on the attitudes of college students toward war.

The articles reporting data for college students may be divided into three groups: those that present data gathered from men, those from women, and those that used mixed groups and did or did not make sex distinctions.

To the first group (those using male subjects) belong the following: Farnsworth (14) who reported on freshmen, Jones (22) on freshmen and

sophomores, Doob (5) apparently on upper-classmen, and Droste and Seyfert (9), Gristle (18), Rogers (31), and Zubin and Gristle (35) who did not indicate the classification of their men. We may presume, however, that the subjects of this latter group were for the most part beyond freshman standing.

In only three of the reports are women subjects used exclusively. Barkley (1) and Duffy (12) both used freshman women, and Corey (3) used freshman and sophomore women.

Studies that present data for both men and women are as follows: Whisler (34) used freshmen, Dudycha (10, 11) and Jones (23, 24) both used freshmen, juniors and seniors, Carlson (2) seniors, Droba (7) and Gilliland and Katsoff (17) apparently used upper-classmen; Day and Quackenbush (4), Ferguson (15), Hartmann (19), Johnson (20), Katsoff and Gilliland (25), Koga (26), Kuhlén (27), Porter (30), Smith (32), and T'an (33) do not definitely indicate the classification of their subjects. Although Ericksen's (13) brief note does not indicate who his subjects were, they may have been college students.

Five publications present data for high school students. These are Jones and Jones (21), Koga (26), Droste and Seyfert (9) who present data for seniors, and Middleton and Fay who present data for high school and industrial school girls in one article (28) and data for corresponding groups of boys in another (29).

TESTING INSTRUMENTS AND METHODS

The two Thurstone scales constructed by Droba and by Peterson are the most extensively used instruments for measuring war attitudes. The Droba scale seems to be preferred to the Peterson scale by many students of this problem.

Of the 20 reports giving results obtained with these scales, the following 12 used the Droba scale: Barkley (1), Carlson (2), Corey (3), Droba (6), Droste and Seyfert (9), Duffy (12), Gilliland and Katsoff (17), Jones, V. (22, 23, 24), Katsoff and Gilliland (25), and Smith (32). The Peterson scale was used in the following 8 articles: Dudycha (10, 11), Ericksen (13), Farnsworth (14), Ferguson (15), Johnson (20), and Middleton and Fay (28, 29). Koga (26) made a Japanese scale similar to the Peterson scale, and T'an (33) made a Chinese scale by the Thurstone method. Gilliland and Katsoff (17) used the same method in the construction of a scale for measuring "Attitude toward participation in war," which was used again later by Katsoff and Gilliland (25).

Prior to the construction of the Droba and Peterson scales questionnaires were used.

Both Porter (30) and Rogers (31) used rather lengthy ones. Somewhat later Jones and Jones (21) also used the questionnaire method. A number of the authors constructed their own scales. V. Jones, (23, 24) used his own scale in addition to the Droba scale after August 1940. Zubin and Gristle (35) constructed a scale for measuring militarism-pacifism which

was later used by Gristle (18). Day and Quackenbush (4) used a war attitude and a war opinion scale that they constructed. Doob (5) made a scale by the simplified Murphy-Likert technique. Kuhlen (27) used a survey blank, and Hartmann (19) a discussion question given in a final examination. Fromme (16) used the interview method with his adult subjects.

COMPARISON OF RESULTS

We shall summarize the results under three divisions: first, those reports that used sundry measuring instruments or scales; second, those reports that used the Droba scale, and third, those that employed the Peterson scale. The order in which those of the first group will be dealt with will correspond roughly to the dates of the data-collection periods.

Porter (30) as early as 1925 secured answers from 1,000 students to a rather lengthy questionnaire dealing with numerous aspects of war. He concluded that the students' attitudes varied with such factors as religious interest, policies of school authorities, social and economic liberalism, pacifistic literature read and speakers heard. In short, whatever their attitudes, they could be accounted for, to some extent, in terms of these influences. Rogers (31) also used the questionnaire, and like Porter tried to discover the factors that determine attitude toward war. Two-thirds of his subjects, who were male students at 10 different eastern colleges and universities, stated that no good is derived from war. Most of the other one-third of his subjects who answered this question affirmatively did not specify what good was derived. He concluded that there was evidence of indoctrination since students who believed that good was derived from war came from the same institutions and specified the same good. Zubin and Gristle (35) in 1937 and Gristle (18) in 1940 used a scale of 65 items designed by them to measure attitude toward militarism-pacifism. No results are presented by Gristle (18). All four of these authors were interested in the relationship of military training to war attitudes.

Koga (26) gave his scale, modeled after the Peterson scale, to 1,642 college and secondary school students in Japan. He reported no significant differences between his college and high school subjects, but he did find that the Japanese students are somewhat more positive in their attitude toward war than American students.

Day and Quackenbush (4) who used both war attitude and war opinion scales with 300 students at a southern university found

that their subjects had, on the whole, an unfavorable opinion about war. Doob (5) tested 135 Yale and 71 M.I.T. students with four scales constructed by the Murphy-Likert method. The first scale measured attitude toward war. On the basis of results obtained, he divided the students into four groups: pacifists, American defenders, hemisphere defenders, and Allies defenders. The first group proved to be the least belligerent and the last the most belligerent, with the other two falling in between. On the whole, however, he concludes that "the group may be thought to have been opposed to war."

Jones and Jones (21) questioned 160 Oakland, California high school students over a period of several years. Although in 1936 and again in 1937 approximately 40% of the boys and 60% of the girls believed that our country must never go to war under any circumstances, the following year less than one-third of the boys and fewer than one-half of the girls marked this statement "true." The authors attribute this shift, and other similar ones, to changing world events. On the whole these high school students were opposed to war, the girls having a greater antipathy to war than the boys. This sex difference is typical of that found generally.

T'an (33) constructed a scale by the Thurstone technique consisting of 56 statements divided into two forms. He found that of the 228 students who responded, 65.3% came very near to approval of war. Two things may contribute to this: China was a nation at war at the time the data were collected, and Chinese students are much more politically conscious than American students. No marked sex differences were reported.

Whisler (34) examined the attitudes of 144 freshmen at the University of Louisville at the beginning and at the close of a course, and he found them to be more liberal in their attitude toward war at the close of the course. The interview method, supplemented by attitude scales, was used by Fromme (16) during the summer of 1939 when he questioned 35 adult men. The low correlation between his various results, led him to observe that there may be some doubt whether one's attitude toward war is unidimensional. He suggests that each person has a complex of attitudes toward war and that the different scales measure different aspects of this complex.

Hartmann (19) submitted one question concerning war to a group of 39 students on May 20, 1940 which was a very critical

time for the Allies. Eight women (29.6%) and 1 man (8.3%) took the pacifist position, and 19 women (70.4%) and 11 men (91.7%) took the opposite position. Although the sex differences remain consistent, the marked shift away from the pacifist position was in all probability due to recent world events.

Gilliland and Katzoff (17) constructed a scale by the Thurstone technique for the measurement of attitude toward participation in the present war. This was given on May 27, 1940 to 206 Northwestern University students as well as to several other groups during the following summer. Rather low coefficients of correlation were found between this scale and the Droba scale, and the results are similar to Whisler's (34). Later Katzoff and Gilliland (25) accumulated data for 1,441 students from 9 colleges and universities scattered throughout the country and found regional differences in attitude.

Jones (23) has studied the attitudes of students toward war over a longer period of time than any other investigator. He has checked over 700 students, over 100 of whom have been followed through from their freshman year to their junior or senior year. In addition to the Droba scale, recently he has used one of his own construction. He reports that his subjects are somewhat less pacifistic since Pearl Harbor, and that there is definite evidence of a change in attitude around the period of the Munich conferences. These conclusions are based on data presented in Table I. Examining these data more closely we find that the 1930-36 seniors are reliably more pacifistic than the freshmen for the corresponding period. When we compare seniors tested early in 1941 with the earlier senior group, we find that they lean less strongly toward the pacifist position; and when we compare seniors tested after December 7, 1941 we find that they deviate from the earlier group still more. In both cases the differences between the recently tested seniors and the 1930-36 group is a statistically reliable difference. Comparing 1940 freshmen and again 1941 freshmen with the 1930-36 freshmen, he finds the shift in the same direction—away from the pacifist position.

Comparing the results obtained by Carlson (2), Corey (3), Duffy (12), and Smith (32), whose data belong to the same period as those of Jones', we find that some tend to be a little more pacifistic and others a little less so than Jones' students. In any case all of the averages, except one, fall in the category labeled

TABLE I

MEAN SCORES OBTAINED WITH THE DROBA SCALE FOR MEASURING ATTITUDE TOWARD WAR

Investigator	Date tested	Type of group	Sex	Number	Mean scores
Jones, V.	1930-36	College freshmen	Men	286	6.81
	1930-36	College seniors	Men	116	7.36
	1938	College freshmen	Men	73	6.61
	1940	College freshmen	Men	69	5.58
	1941	College freshmen	Men	64	6.44
	1941	College freshmen	Women	50	6.60
	1941	College juniors	Men	38	6.79
	1941	College seniors	Men	50	6.68
	1941	College seniors	Men	?	6.48*
Carlson	1931-32	College seniors	Both	215	7.12
	1931-32	College seniors	Men	?	7.06
	1931-32	College seniors	Women	?	7.17
Smith	1932-36	College students	Both	282	6.5
	1932-36	College students	Men	124	6.4
	1932-36	College students	Women	158	6.6
Corey	1934-35	College freshmen	Women	234	6.94
Duffy	1935	College freshmen	Women	38	7.50
	1935	Parents of above	Men	38	6.23
	1935	Parents of above	Women	38	6.72
Barkley	1939-40	College freshmen	Women	68	6.83-7.51†
	1939-40	College freshmen	Women	75	6.45-7.03†
Droste & Seyfert	1940	Mil. acad. seniors	Men	40	6.4
	1940	H. S. seniors	Men	40	6.9

* Tested after Pearl Harbor.

† Fall and spring testing of the same group.

"mildly pacifistic" or "strongly pacifistic." On the whole the women tend to lean toward the pacifist position more than the men. This is consistently the case in any one study that presents data for both sexes; and largely true when we compare results from the different studies, providing dates of testing are taken into consideration.

TABLE II

MEAN SCORES OBTAINED WITH THE PETERSON SCALE FOR
MEASURING ATTITUDE TOWARD WAR

Investigator	Date tested	Type of group	Sex	Number	Mean scores
Farnsworth	1932	College freshmen	Men	321	3.96
	1933	College freshmen	Men	81	3.90
	1934	College freshmen	Men	84	4.05
	1935	College freshmen	Men	108	3.50
Dudycha	1937-38	College freshmen	Both	319	3.72
	1937-38	College freshmen	Men	235	3.85
	1937-38	College freshmen	Women	84	3.38
	1940	College freshmen	Both	185	3.86
	1940	College freshmen	Men	129	3.92
	1940	College freshmen	Women	56	3.73
	1937-39	College juniors	Both	163	3.78
	1937-39	College juniors	Men	104	3.81
	1937-39	College juniors	Women	59	3.71
	1940	College juniors	Both	74	3.76
	1940	College juniors	Men	56	3.69
	1940	College juniors	Women	18	3.97
	1938-39	College seniors	Both	105	3.73
	1938-39	College seniors	Men	69	3.82
	1938-39	College seniors	Women	36	3.56
	1940	College seniors	Both	59	3.75
	1940	College seniors	Men	35	3.77
	1940	College seniors	Women	24	3.73
Johnson	1939(?)	College students	Both	68	4.0
Middleton & Fay	1939	Delinquents	Girls	83	3.96
	1939	H. S. students	Girls	102	4.11
	1939	Delinquents	Boys	139	4.52
	1939	H. S. students	Boys	75	4.13

Data obtained with the Peterson scale are presented in Table II. All of the mean scores obtained by the various investigators at different times are within the category marked "moderately opposed to war." Again we find that the women make mean scores that lean slightly more strongly toward opposition toward war than the men. There is only one exception to this in the entire table, this is in Dudycha's 1940 junior women who are slightly less pacifistic than the men. However, this group of women is very

small which may account partly for the deviation. Data taken from Dudycha afford a comparison between freshmen, juniors and seniors tested before the war and similar groups after the war had been in progress for approximately a year. All of these differences are small and none is statistically reliable. These results, then, do not seem to bear out the conclusion drawn by Jones, on the basis of the Droba scale, with similar groups of students.

TEST-RETEST RESULTS

Nearly one-third of the studies make some mention of retest data. Since it is very difficult to follow the same group of individuals over a period of several years, these data are necessarily limited. Porter (30) in his early study submitted his questionnaire to 97 of his 1,000 students after one year and found but slight differences. Jones (22, 23) followed a group of over 100 students from freshman to senior years with the Droba scale and found a very small, but definite, shift in the direction of greater pacifism. Again he tested 64 freshmen in September of 1941 and again in December of the same year and reports a negligible difference. Consequently he concluded that the general attitude toward war shifts but little, whereas attitudes toward specific issues may change considerably.

Farnsworth (14) retested 55 of his 1932 Stanford University freshmen a year later as sophomores with the result that the freshman mean score was reduced from 3.91 to 3.80. Again 50 of the 1932 freshmen were retested two years later as juniors with a reduction of the mean score from 3.93 to 3.50. A final group of 50 of the 1932 freshmen tested 3.72 as freshmen and 3.43 as seniors. Even though none of these test-retest differences is statistically significant, the general trend in the direction of greater pacifism, as students pass through four years of college, is noteworthy. Smith (32) gave Form A of the Droba scale to a large group of students at the beginning of the semester and Form B at the close of the semester. For the whole group of 282 students the mean scores were 6.5 at the beginning and 7.1 at the end of the semester. The results for the 124 men were 6.4 and 6.9; for the 158 women they were 6.6 and 7.2. In all cases the shift is in the direction of greater pacifism. Corey (3) using the same scale tested 100 college freshman women as freshmen and again as sophomores with a mean score shift from 7.10 to 7.19. This is consistent with the above results.

Jones and Jones (21) submitted their questionnaire four times over a three-year period to a group of 160 senior high school students. These authors observed a shift from 1936 to 1938 in the general direction of opposition to war and toward greater interest in international organizations that foster peace.

Dudycha (10), using the Peterson scale, presented retest data for 143 college students originally tested in 1937 or 1938. All of the test-retest differences were small and none was statistically significant. Breaking down the results, he found that 59.4% of the 143 students remained in the same attitude category on both tests, and that 40.6% of them shifted to a different category. Of this latter group, 19.6% shifted in the direction of greater pacifism, and 21% changed in the direction of less pacifism. Later Dudycha (11) presented data for 49 1937 freshmen retested as 1939 juniors, and 51 1938 freshmen retested as 1940 juniors. The shifts for both groups from freshman to junior year are much the same in spite of the fact that the first group was tested before the war started and the second group was tested before and again after it started. Hence it was concluded that the war had little apparent effect on these students' attitudes to that date. Barkley (1) using the Droba scale tested two groups of college women in the early fall and again in the late spring. Both groups shifted in the direction of greater pacifism on the retest. The results are presented in Table I.

Kuhlen's (27) article differs from the others in that it does not measure war attitude, but rather changes in attitude due to the war. From his test-retest data Kuhlen points out that after each major event of the present war, such as the invasion of another country, a shift in attitude toward Germany occurred in his college subjects. Gilliland and Katzoff (17) using a test of their own construction designed to measure attitude toward participation in the present war found, from test-retest data collected during the summer of 1940, that successive tests indicated a greater inclination toward participation.

COMPARISON OF STUDENTS WITH THEIR PARENTS

One article compares the attitudes of students with those of their parents. Duffy (12) compared the attitudes of 38 Sarah Lawrence College girls with those of each parent and found that the daughters were "strongly pacifistic" whereas both parents were "mildly pacifistic." The difference between the mean scores ob-

tained by fathers and mothers is small and statistically unreliable; but the differences between the daughters and fathers, and daughters and mothers are statistically reliable.

WAR ATTITUDES AND MILITARY TRAINING

As we noted above several studies grew out of an interest in the relationship between war attitudes and military training. Porter (30) was among the earliest to direct some attention to this matter. He found that 19 men taking military science during the time of testing showed a very small shift toward pacifism, and that 27 other men who had military science, but not during the period of testing, showed a very small shift toward militarism. He concluded that the kind of attitude held depended, among other things, on the policy of the ROTC staff members. The significant point about his observations is that all of the shifts in attitude that he observed were very small.

Rogers (31) submitted a list of 17 questions that dealt primarily with war and military training to students at 10 eastern colleges and universities. At six of these schools military science was an elective, and at the other four it was compulsory. Two-thirds of the students stated that no good is derived from war. At one institution, however, 14% of students in the advanced course stated that war serves a good in that it accelerates scientific progress. Even so, the percentage is relatively small.

Zubin and Gristle (35) and again Gristle (18) used students enrolled in military science courses and those not enrolled in such courses as a means of weighting the items in their militarism-pacifism scale. Jones and Jones (21) included the question, "military training should receive strong support in our colleges and high schools," and found that "the boys lagged behind the girls in approval of this proposition."

Droste and Seyfert (9) took a sample of the 1908-1936 graduates of a military academy and studied their attitudes and preferences. They report that less than one-ninth of their respondents showed any militarism, and that there is no evidence that military school graduates show any "abnormal appetite for military careers," nor that they select colleges that have military training. They also compared military school seniors with a corresponding group of non-military school students on the Droba scale and found a negligible difference between the mean scores of the two groups.

Dudycha (10) made a careful study under somewhat controlled

conditions of the attitudes of college men taking and not taking advanced courses in military science. Although all men students at Ripon College must take the basic work in military science, the advanced course is an elective. Hence a comparison of men taking and not taking the advanced course afforded an opportunity to compare the attitudes toward war of the two groups and to note evidence of indoctrination if there was any. Using the Peterson scale, he found differences between junior men taking and not taking the junior course, and between senior men taking and not taking the senior course that were statistically unreliable. He concludes that students "who take advanced courses in military science are about as likely to shift in the direction of greater pacifism as those who do not receive such instruction."

DISCUSSION AND CRITICISM

In an earlier section we noted the variety of methods used in the study of war attitudes. Questionnaires were used in the beginning followed very soon by the extensive use of more formal scales, particularly the Droba and Peterson scales constructed by the Thurstone technique. The fact that these scales have been used for the past ten years by a large number of investigators for testing groups of students in different types of schools and in all parts of the country gives us an opportunity to examine critically what has been discovered and what the future of this type of testing may be.

The seeming advantage of Thurstone's attitude scales is that with them a score is readily determined for each person whose attitude is measured, and from these individual scores means for groups can be found. All of the articles that used the Droba and Peterson scales report mean scores for the groups tested, and make comparisons on the basis of these means. All of these means indicate that both students and adults are, on the average, moderately opposed to war. This uniformity in results has led to some skepticism. Jones (23, 24), who has used the Droba scale longer than any other investigator reported here, observes that individual variability is large. Although a student's final score may be 6.7, he does not merely endorse those statements that have a scale value close to this average, but he may also endorse statements that are near *both* limits of the scale and that represent opposing attitudes. Jones contends that therefore the student's score does not give a complete picture of his attitude toward war. That this is not just an isolated case is evident from the fact that the average deviations

and sigmas are large for most groups. The present writer, who has given the Peterson scale to over 900 college students, has observed the same fact in his results and has been somewhat disturbed about it.

The Thurstone scales assume that the attitude measured is a single continuum and that the person's true attitude falls somewhere between the extremes of the scale. Jones, on the other hand, contends that we must substitute the theory of multiple continua—war attitude is not a single thing but a complex of attitudes. He further maintains that students may have attitudes toward specific issues that may change without changing their general attitude toward war. Fromme (16) in similar vein contends that there is no single attitude toward war but rather that the war attitude is a complex of attitudes.

Ericksen (13), having used the Peterson scale, also criticizes the use of such scales. He believes that the scales are not sensitive enough to changes in attitude; that the distributions obtained are skewed or bimodal, and that 1930 norms are inadequate for 1940-41 scale results.

That the study of war attitudes by social scientists is worth while is unquestioned, but whether the methods used are yielding the results we desire is questionable. Social changes and world events that markedly alter the thinking of people may be of such proportions that scales which once seemed useful may no longer be of value. This does not imply that all we can do is fall back on the simple questionnaire method, but rather that we should pioneer in new methods that transcend the inadequacies of the old. This may mean multiple-plane scales such as Jones and Fromme suggest, the interview procedure used by the Office of Public Opinion Research, or some as yet untried methods of measuring attitudes in actual life situations.

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SPECIFICATION AND DESCRIPTION OF COLOR*

AMERICAN WAR STANDARD

Approved June 17, 1942

AMERICAN STANDARDS ASSOCIATION

FOREWORD

For almost half a century, spectrophotometry has been the accepted method for the determination of those characteristics of an object which relate to its color. The National Bureau of Standards pioneered in this type of measurement and has continued its use as a primary method.

Color standardization and specification for technical purposes have been an accomplished fact for at least twenty years. The 1922 Report of the Colorimetry Committee of the Optical Society of America codified and published a standard procedure based on scientific investigations carried out by leading investigators in this and other countries since the middle of the nineteenth century. In 1931 the International Commission on Illumination adopted essentially the same procedure, with details modified on the basis of the most recent and reliable investigations, incorporating almost completely the recommendations of the National Bureau of Standards and the British National Physical Laboratory. This system has been widely published, elaborated for convenience in practical applications, and extensively used during the past decade in academic and industrial laboratories both here and abroad.

The chief criticism of this basic system of color specification has been due to its technical character, very little provision having been made for its interpretation in familiar terms. This limitation has been overcome in the present standardization by recognition of the correlation between the basic system and the useful and ready comprehensible system of colored samples embodied in the 1929 Munsell Book of Color. Reference to the Munsell Book of Color supplemented by the basic specifications of the colors exhibited therein, provides a convenient, readily comprehended interpretation of the basic specifications, and facilitates their visualization. This is especially important for those who are not familiar with the basic specifications of color. Used in this manner, the 1929 Mun-

* This is published at the request of the Inter-Society Color Council, on the recommendation of the chairman of the A.P.A. representatives on the council with the permission of the American Standards Association.

sell Book of Color bridges the gap between the aesthetic and qualitative comprehension of color employed by artists, designers, and the general public, and the basic specifications employed by and necessary for the purposes of science and industry.

When a numerical specification of color is undesirable, the use of a correlated system of color names adapted from common language and proposed by the Inter-Society Color Council is recommended. This system of color names has been defined in terms of the Munsell system, and provides a literary method for the description of color where general comprehensibility is desired and precision is not important.

1. PURPOSE

To recognize and recommend a basic method for the specification of color, and to facilitate its popular interpretation.

2. PROVISIONS

2.1.* The spectrophotometer shall be recognized as the basic instrument in the fundamental standardization of color (1).

NOTE: Specifications of the spatial distributions of the incident and collected light are essential to the standardization of spectrophotometry. Until standard conditions are established by agreement, the particular conditions employed in each instance should be stated clearly.

2.2.* Color specifications computed from spectrophotometric data shall be found by means of the standard observer and co-ordinate system adopted in 1931 by the International Commission on Illumination (2, 3, 4).

In the absence of a special reason for adopting some other illuminant in reducing spectrophotometric data, standard ICI illuminant C, representative of average daylight, shall be used (2, 3, 4).

The basic specifications of color shall consist of the tristimulus value, Y , and the trichromatic coefficients, x and y , of the ICI co-ordinate system, or they shall consist of the tristimulus value, Y , and the dominant wavelength and purity (3, 4).

* The alternative, but coordinated systems of color specification described in 2.1, 2.2, and 2.3 are each adequate for specification of color tolerance in those cases for which each system is useful and convenient. As in all engineering specifications, the tolerances in different industries vary and depend upon the uses for which the products are intended. Color specifications according to 2.2 and 2.3 are, strictly speaking, appropriate only for products viewed by normal vision, but in the absence of agreement on standards for anomalous color vision or vision at low illuminations no more appropriate color specifications are available.

NOTE: Dominant wavelength and purity are obtainable by computation (3, 4) from the trichromatic coefficients, x and y . Several methods of expressing purity have been proposed and used to some extent. In this standardization, purity refers to the quantity which is called excitation purity in discussions (4, 5, 6) of the several possible purity scales. For the sake of uniformity, the symbol, p , and expression in terms of per cent is recommended for purity. Likewise, when Y is specified in terms of reflection factor it should be expressed in per cent, symbol, R . It is customary to express dominant wavelength in millimicrons, μ , and this practice is recommended, together with the symbol, λ .

2.3.* For the popular identification of color, material standards may be used. The only system of material standards that has been calibrated in terms of the basic specification is represented by the 1929 edition of the Munsell Book of Color (7, 8). The use of this book is recommended wherever applicable to the specification of the color of surfaces. Approximate identifications of Munsell hue, value, and chroma may be secured by direct visual comparison with the samples in the 1929 Munsell Book of Color. When the most accurate visual comparisons are needed, the mask method (9) is recommended. Wherever more exact Munsell notations are desired, they shall be found from the basic specification, Y , x and y by interpolation among the smoothed curves (10, 11) for Munsell hue, value, and chroma.

NOTE: Most surfaces whose colors fall outside the range covered by the samples of the 1929 Munsell Book of Color cannot be assigned Munsell notations by reference to the smoothed curves. For such surfaces, for transparent media, and for illuminants, only the basic specification Y , x and y , or Y , dominant wavelength and purity are recommended.

2.4. A descriptive name according to the ISCC-NBS system of color designation (9, 12) may be derived from the Munsell notation. This name is recommended wherever general comprehensibility is desired and precision is not important. The use of color names for color specification is not recommended.

NOTE: It should be emphasized that the ISCC-NBS names are descriptive only and are not adapted to sales promotion nor intended to replace names that are developed for that purpose.

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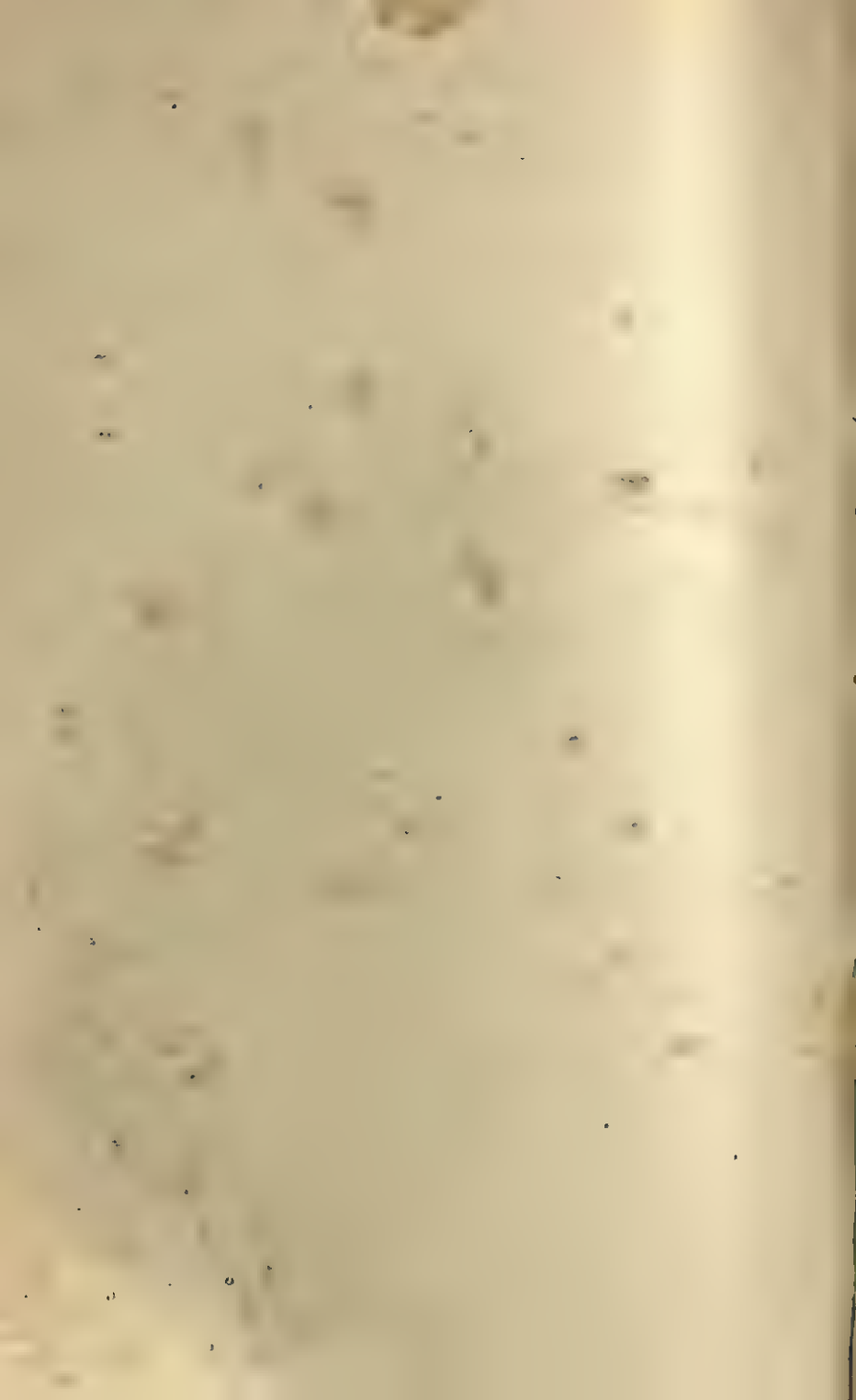
PSYCHOLOGY AND THE WAR

Edited by

STEUART HENDERSON BRITT

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PSYCHOLOGISTS AND THE ARMY SPECIALIST CORPS*

BY DONALD E. BAIER

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The rapid expansion of the Armed Forces at a time when demands on the manpower of the nation are very great has made it necessary to induct into the Army men whose response to training will be slower than that which has characterized the highly selected group already bearing arms. Consequently it is desirable to have appropriately trained professionals available in the Army to advise on the selection, classification, and assignment of such personnel.

The greater part of the Army's need for psychologists is divided between the field forces and the zone of interior installations. Psychologists serving with the field forces are selected from officers and from enlisted men who have already completed basic military training in the Army. Psychologists employed in the zone of the interior, on the other hand, are recruited from that part of the male civilian population which is regarded as less suited for field duty because of physical limitations or dependency. These men are commissioned in the Army Specialist Corps and are assigned to two principal types of duty.

One of these occurs in Army recruiting and induction stations where technical assistance is needed in selecting those men who are capable of being trained rapidly in the duties of a soldier. The requirement that those accepted for induction possess fourth grade literacy in English has been removed and effective August 1, 1942,

* The Army Specialist Corps has been discontinued, but the substance of what follows remains applicable to the Army of the United States save that the standards of eligibility to be met by either Army Specialist Corps officers or civilians have been revised as follows:

- a. If under age thirty-five, prior commissioned service or classification as IV-F is required.
- b. If age thirty-five to forty-five, prior commissioned service or classification other than I-A or II is required.

Exceptions may be made only where there is critical need for the services of a particular individual or where the individual is within a scarce category of specialized skill in which not enough trained men to fill the requirements of the armed forces are available at the time required.

"Any registrant who is able to understand simple orders in English and who possesses sufficient intelligence to absorb military training rapidly is eligible for induction into the military service." However, "The number unable to read and write English in a fourth grade standard who are accepted for induction on any day at any recruiting and induction station will not exceed ten per cent of the white and ten per cent of the colored registrants." (War Department Circular No. 169, June 1, 1942.) Also, provisions were made for selecting and inducting the more readily trainable non-English speaking men.

Group and individual mental tests and other screening techniques were prepared in order to standardize and objectify the procedures used in carrying out the above directives. In order to insure maximum efficiency for these procedures the procurement of approximately 186 psychologists to be commissioned in the Army Specialist Corps, half as First Lieutenants and half as Second Lieutenants, was authorized. To be eligible for a commission, an applicant had to be either:

- a. between the ages of thirty and forty-five and have a Selective Service Classification other than I A, I B, II A, II B,* or
- b. under thirty years and have a Selective Service Classification of IV F, or
- c. over forty-five years.

To qualify for a commission as First Lieutenant, the applicant was required to possess a Ph.D. degree in psychology or have completed one year of graduate training in psychology, supplemented by practical experience in psychological examining. To qualify as Second Lieutenant, the applicant must have completed a major in psychology at an accredited college or university—plus some post-graduate work or clinical experience in psychological examining. In addition, the applicant was required to demonstrate his physical fitness by passing an officer's final type physical examination. The physical requirements of the job were considered in granting waivers for certain defects.

All applications were first reviewed for eligibility and professional qualifications by a three-man board consisting of three professional psychologists.† Applicants were rated by each of the members, first in respect to suitability for commissioning as First or Second Lieutenant. This dichotomy was based not only on the

* This was the final decision for this age group.

† The writer served as secretary to this board.

amount of training and relevant experience but also on age and achievement as reflected in professional status and earnings. The applications in each group were then rated on a four-point scale according to the degree of confidence with which the rater recommended the applicant. A sufficient number of those receiving the higher ratings for First Lieutenant and for Second Lieutenant were authorized to take physical examinations, to forward certificates showing Selective Service Classification, and to sign waivers of government responsibility for physical defects where indicated. Those already employed by the Federal Government were also required to obtain and forward official releases from their current positions.

The applications which survived these steps were then forwarded to a final administrative selection board and commissioning authority which was entirely independent of the preliminary and professional selection authority.

The applicant population included a majority of Ph.D's in psychology, most of whom had a good deal of experience in clinical psychology, vocational psychology, personnel, and allied fields. On this account many of those recommended for commissioning as Second Lieutenants possessed formal qualifications making them eligible for commissioning as First Lieutenants. Recommendation for the senior rank therefore meant that the applicant's qualifications placed him within the upper half of the recommended applicant population.

Those psychologists commissioned as First Lieutenants bear the principal responsibility for

- (1) selecting from the processing line in the Induction Station those men whose suitability for induction is in doubt;

- (2) supervising the testing of these men and the interpreting of their test scores in relation to other data in order to arrive at a determination as to which are acceptable for induction, and which are unacceptable;

- (3) forwarding to the Reception Centers the findings on the men accepted for induction to assist in their initial classification and assignment in the Army.

The Second Lieutenants are responsible to the First Lieutenants who see that they carry out those parts of the screening procedure to which they are assigned. Both officers assist in the collection of data from which the validity of the screening tests and procedures may be determined and on the basis of which revisions and improvements are being made.

Most of the psychologists commissioned in the Army Specialist Corps to carry out the Induction Station screening procedures were instructed in the fundamentals necessary to their effective functioning in the Army as officers, as well as in the problems attendant upon carrying out their special tasks. This instruction was given in a special ten-day school which began October 11 at Fort Leavenworth, Kansas, and included experience on the job in an Induction Station and in a Reception Center. Those who were not commissioned in time to attend this school have been given similar training by their Service Command personnel consultant who is the Army officer charged with the supervision of the program in each of the nine Service Commands.

The other type of duty for which psychologists were commissioned in the Army Specialist Corps occurs in Replacement Training Centers and other installations in the zone of the interior. Specially selected Army officers, known as personnel consultants, have been assigned to these installations to advise classification officers and others responsible for personnel management, in regard to general policies and to the problems of the atypical soldier especially as they relate to his classification, training and assignment. In order to release these men for similar duties with the field forces, an additional fifty psychologists, selected in the manner described above, were commissioned as First Lieutenants in the Army Specialist Corps. The functions of these men vary with the different training programs and problems existing in the various installations and with their individual competencies.

In these ways psychologists have been given an excellent opportunity to contribute to the fabrication and maintenance of a fighting organization.

SOME SUGGESTIONS FOR PSYCHOLOGISTS

BY GARDNER MURPHY

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The editor of this section has asked me to prepare a brief statement on the contributions which can be made toward the war effort by those psychologists who are not in the armed forces or employed elsewhere in government service. Such suggestions must be woefully incomplete; but this preliminary statement may arouse discussion, clarification, and supplementary publication by others so as to give a more rounded picture.

1. A large amount of war research is being carried on privately in universities, colleges, and clinics. There are, for example, studies of oxygen deprivation and of the curve of work which, in confidentially circulated form, appear to interest the Army and Navy. There are many psychological studies done through local ROTC units, having to do with the qualities of leaders and with methods of leadership training, which by achieving local success may lead to gradual broadening and recognition of the value of such private research. With regard to all such research directly bearing on the efficiency of the armed services, it is important that the contributor send an outline of his project to the Office of Psychological Personnel, to receive suggestions as to which military or civilian authority might most appropriately make use of it, distribute it, or suggest a contractual form in which it should be prepared.

2. The government public-opinion services are being facilitated in a large way by private opinion-polling services, both of the commercial type and of various non-commercial university types. In numerous instances in the last few months, university opinion-polling agencies have been able to do quick and effective sampling of regional opinion distribution, or have been able to try out rapidly a hypothesis which would take a good deal of time to test through the normal production flow of any of the government opinion-polling agencies. No psychologist need be apologetic for his small sample or his crude methods. The Division of Program Surveys of the Bureau of Agricultural Economics, United States Department of Agriculture, informs me that private attitude studies, whether to supplement government samples or as "pilot studies" in preparation for larger government investigations, are of very great importance to the war effort.

3. Psychologists as educators and as participants in campus

war-time activities can do a great deal to point out efficient methods of experimenting on the curriculum to give it the best relation to the present educational task. Being relatively free from the pressure of sheer tradition on the one hand, and from the impetuous desire to pull the curriculum apart on the other hand, psychologists can give a research orientation, a fact-finding slant, to the curricular revision which is already under way.

4. Psychologists are hardly aware of the fact that the social agencies which rely so heavily upon psychology and psychiatry are at present in the most *desperate* need of more part-time and voluntary psychological service. Professional case loads of social workers, vocational guides, etc., are mounting at the very time when personnel is dwindling. The psychological damage to the community, especially to children, is already alarming, with neglect and delinquency as the grosser evidences, and in a year or two more is likely to be catastrophic. The bridge has not yet been constructed between the tremendous need on the one hand, and the large number of qualified psychologists eager to help on the other hand. Psychologists with some clinical training can find out in their own communities how they can help carry this burden. In long-range mental hygiene and morale terms, nothing is more important.

5. Basic attitudes towards the post-war world can be intensively studied through collaboration with sociologists, psychiatrists, and social workers, region by region, community by community, class by class. The Washington agencies are by no means inclined to the view that long-range post-war thinking interferes with the prosecution of the war. On the contrary, psychologists seem to be doing much less post-war thinking than is the government itself. Such thinking and research, at a high level of seriousness and realism, constitute a major opportunity for those psychologists who, in close touch with the course of world events and the Washington situation, will help to gather data to give a factual basis for an enduring and humane peace.

OCCUPATIONAL DEFERMENT OF PSYCHOLOGISTS AND PSYCHOLOGISTS IN TRAINING

BY STEUART HENDERSON BRITT

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The expanding needs of our Army, together with public statements issued by various officials, have resulted in a very critical situation with respect to occupational deferment of psychologists, graduate students of psychology, and undergraduate majors in psychology. The following material has been prepared in order to give factual information to psychologists and employers of psychologists regarding the exact steps to be taken in connection with claims for occupational deferment.

The ever increasing demands on Local Boards make it important that these Boards receive the wholehearted cooperation of every psychologist and psychologist-in-training to the end that every individual may be engaged in the capacity in which he will most effectively serve the war effort. This responsibility for seeing that the most effective use is made of psychologists and that a continuing supply of psychologists is assured rests *jointly* with (1) the Local Board, (2) the individual concerned, and (3) his employer. The members of a Local Board can be expected to act intelligently only when they are given the *complete* background of the case and when they have confidence in the sincerity of the motives underlying the request for occupational deferment.

POLICY

In the last analysis the only basis for requesting or for granting occupational deferment must be whether the war effort is best served thereby. Deferment problems must be presented to and dealt with by Local Boards on this basis. Since requests and memoranda cannot cover all possible cases, it is the obligation of both the employer and the registrant not only to consider a case in terms of this broader basis but also to supply to the members of the Local Boards a type of information which will direct their attention to this same principle. A proper policy for psychologists to follow in requesting deferment might contain the following points:

- (1) Ask for deferment only in cases where this is justified by an immediate or potential contribution to the war effort, and in which the registrant or his employer is prepared to appeal to the highest authorities.
- (2) Be willing to give time and attention to each case to insure that

Local Boards are made fully aware of the facts both as to the general situation in psychology and the particular circumstances of each case.

(3) Proceed on the assumption that Local Boards are capable of making intelligent decisions when they have full information brought to their attention. Full information means not only the bare facts but also an explanation of the significance of these facts in relation to the war effort as a whole and to the particular phase of war work with which the registrant and his employer are concerned. (For example, it is not adequate simply to make the blanket assertion that "it is well known that graduate assistants or instructors cannot be replaced"—explanations and supporting evidence are needed. Merely to state that a man is a "psychology teacher" is not enough—a statement of how and why such work is important would be of much more assistance to the Local Board.)

(4) Having requested deferment on defensible grounds, exert every effort to secure that deferment, including the taking of appeals.

(5) Be prepared to work under Selective Service procedures *as they are* (rather than as one thinks they should be) and become familiar with Local Board personnel and attitudes. The presentation of a case for deferment resembles in some ways the presentation of a legal case, and many of the same factors are involved.

It cannot be too strongly emphasized that the successful handling of deferment cases depends primarily on intelligent, cooperative action on the part of the registrant, his employer, and the Local Board concerned.

The general criteria on which Local Boards base their decisions regarding occupational deferment are presented in considerable detail in Memorandum to State Directors I-405 (Local Board Release 115 amended by Local Board Releases 122 and 137). To be considered for occupational deferment, the registrant must be a "necessary man" (or a "necessary main in training and preparation") in an activity either supporting the war effort or necessary to war production. The registrant must meet the following tests in order to be classified as a "necessary man":

1. He must be engaged in a "critical occupation" in an activity necessary to war production—or essential to the support of the war effort.
2. He cannot be replaced because of a shortage of persons with his qualifications or skill.
3. His removal would cause a serious loss of effectiveness in such activity.

Psychologists are listed in Selective Service Occupational Bulletin No. 10, June 18, 1942, as falling within a "critical occupation" generally, and the shortage of psychologists is certified to in this same Bulletin (see *Psychological Bulletin*, 1942, 39, 525-528). "Educational services" are stated to be an essential activity in

Memorandum to all State Directors I-435, July 15, 1942 (see *Psychological Bulletin*, 1942, 39, 670).

PROCEDURE

The following procedures are suggested in view of the policy and general principles described above:

(1) *Persons not yet classified.* Form 42 or Form 42-A should be submitted by the employer or institution requesting deferment. This should be prepared for anyone for whom occupational deferment is contemplated and should be submitted *immediately* after the person concerned has received his Selective Service questionnaire. This form should be accompanied by supplementary material. With some Boards it may be advisable to present all or part of this material in affidavit form. It should include:

a. Excerpts and quotations from authoritative sources regarding the part psychology and psychological training are playing in the war effort.

b. Material showing exactly why the person concerned is important to the war effort in his present position and how he is contributing to the war effort.

c. Material showing specifically why it would be difficult or impossible to replace the registrant in his present duties and what efforts if any have been made to replace him.

(2) *Psychologists in II-A or II-B.* Deferments in II-A or II-B are generally for a period of months only, and each case must be reconsidered by the Local Board at the expiration of this period. The chances of obtaining continued deferment will be greatly increased if it can be shown that a conscientious effort has been made to replace the registrant and that this effort has failed. From the point of view of the Local Board, it probably will not be sufficient for the employer simply to state that he has made an effort to replace the man and has not succeeded. Specific evidence must be supplied to support any such contention. As a result of personal experience, heads of Psychology Departments realize the difficulty of replacing anyone trained in psychology, but Local Boards are completely unfamiliar with this situation and have a perfect right to expect a statement to this effect to be backed up by concrete evidence. Such evidence might include sample copies of letters of inquiry concerning men to replace the registrant, replies received, etc.

(3) *Psychologists now classified III-A.* In view of the probable reclassification of men with dependents, it is highly desirable to

have in the hands of Local Boards information which will permit the reclassification of III-A registrants into III-B ("persons with one or more dependents who are engaged in an activity either essential to the war production program or essential to the support of the war"). Material similar to that indicated above, including Form 42-A, should be submitted together with a request for reclassification into III-B.

(4) *Psychologists classified I-A.* Immediately upon receipt of notice of classification, a written request for reconsideration by the Local Board should be made. This request should be in such a form as also to constitute an appeal to the Board of Appeal in the event that the Local Board's reconsideration does not result in a satisfactory reclassification.

If the material listed under (1) above has not previously been supplied, it should be placed in the hands of the Local Board at once together with the best possible explanation of why this has not been done previously. Submission of a request for occupational deferment *after* a I-A classification has been given will probably suggest to a Local Board either negligence or a lack of sincerity in the request. This situation must rightly be clarified before any consideration can be given to such a request.

If incomplete information (Form 42-A only, for example) has been submitted, this should be rectified at once and a request should be made for reconsideration in the light of the new information. Again an explanation of why this material was not previously submitted is due the Local Board.

If all possible information has already been submitted to the Board, a request for reconsideration or at least for a discussion of the case should be made. A discussion of the case will at least give an opportunity to ascertain the attitudes of the Board members. Failure to grasp the significance of the situation, or personal factors, may be found to have influenced their decision. All such information may properly be used in carrying an appeal to the Board of Appeal.

APPEAL

If it becomes apparent that the end of negotiations with the Local Board has been reached without having modified the registrant's I-A classification, the appeal to the Board of Appeal should be carried through. *Such an appeal must be made within 10 days of the date when the Local Board mailed to the registrant a notice of classification.* This appeal should previously have been instigated either

by filing a written request with the Local Board, or by filling in and signing the Appeal to Board of Appeal request on page 8 of the Selective Service Questionnaire. This may be done by the registrant, by his employer, or by the Government Appeal Agent. Consultation with the Government Appeal Agent may be desirable at this point. He may be reached through the Local Board or through the State Director of Selective Service. The following information taken from the Regulations of the Selective Service System indicates the proper appeal procedure in greater detail:

Memorandum I-398 of March 9, 1942, set up a procedure whereby a Local Board, which refuses a II-A or II-B classification to a man whose deferment has been requested by his employer or college on occupational grounds, is required to send a notice of the employer's right to appeal to the company or institution requesting deferment.

Parts 627 and 628 of the Selective Service Regulations deal with appeals, the former having to do with Appeal to the Board of Appeal, and the latter with Appeal to the President. Since this last case may be instigated only by State Directors or on dependency ground, it is not of great concern here.

An Appeal to the Board of Appeal may be instigated by (1) the State or National Director of Selective Service, (2) the registrant, (3) any person who claims to be a dependent of the registrant, (4) any person who has filed written evidence of the occupational necessity of the registrant, or (5) the Government Appeal Agent. Such appeal must be instituted within 10 days of the time the local board mails to the registrant a notice of classification. (The Government Appeal Agent may, however, take an appeal at any time prior to the time an order to report for induction is mailed to the registrant.) An extension of time (up to the time an order to report for induction is sent out) may be granted by the Local Board if it is satisfied that failure to appeal within the 10-day period was due to lack of understanding of the right to appeal, or to circumstances beyond the control of the person making the appeal.

Any person entitled to do so may appeal (1) by filing with the Local Board a written notice of appeal, or (2) by signing the "Appeal to Board of Appeal" on the Selective Service Questionnaire. The person appealing may attach to his notice of appeal a statement specifying the respects in which he believes the Local Board erred, may call attention to pertinent information in the registrant's file, and may set out in full any additional pertinent information which the Local Board failed or refused to include in the applicant's file.

The Board of Appeal, having taken action, will direct the Local Board to mail to the registrant either a notice of continuance of classification or a new notice of classification depending on its decision. The Local Board may not issue an order to report for induction either during the period afforded the registrant to make an appeal or during the time such an appeal is pending. Any such order, already issued, shall be ineffective and shall be canceled by the Local Board.

NATIONAL ROSTER OF SCIENTIFIC AND
SPECIALIZED PERSONNEL

Some of the activities of the National Roster of Scientific and Specialized Personnel with reference to the possible occupational classification of professionally trained registrants has been mentioned in earlier issues of the *Psychological Bulletin* (April, 1942, 39, 257-260; November, 1942, 39, 773-793). The following is a more detailed statement of the ways in which the National Roster may be able to assist with reference to the proper classification of psychologists.

Any psychologist who has not already done so should register immediately with the National Roster. This may be done by writing a letter to the National Roster of Scientific and Specialized Personnel, 10th & U Streets, N.W., Washington, D. C., and asking for appropriate forms in psychology. In this communication, the writer should indicate whether he is subject to the Selective Training and Service Act of 1940.

Undergraduate majors in psychology will automatically have an opportunity to register with the Roster during the academic year, when special student questionnaires for technically trained students are sent at periodic intervals to the registrars of their colleges and universities. However, the National Roster can take no action whatsoever regarding the Selective Service status of any undergraduate student.

On the other hand, the National Roster may take appropriate action in the case of professional psychologists and graduate students in psychology. Under a cooperative plan with the Selective Service System, the Roster may send to the National Headquarters of the Selective Service System appropriate information about professionally trained men of military age, and that office in turn may then forward letters about these men through the various State Directors to the individual Local Boards in order to assist in proper classification. Because the National Roster was organized prior to the beginning of the Selective Service System, it is obvious that detailed information on a man's Selective Service status is not necessarily a part of his Roster questionnaire. Therefore, even though a psychologist has at some time in the past registered with the National Roster, he should write to the Roster for a special Selective Service questionnaire in case he has not already received one.

It is essential that a man (or his employing institution) should *not* wait until he is placed in Class I-A before writing to the Roster. Instead, detailed information regarding his Selective Service status and duties in his employment should be sent to the Roster at the earliest possible date.

In case a man is placed in Class II-A or II-B and that classification is about to expire, he should notify the Roster to this effect at least some weeks in advance. Also, he should notify the Roster at once of any change in employment or in duties performed in his present employment.

OFFICE OF PSYCHOLOGICAL PERSONNEL

Because of its semi-official nature, the Office of Psychological Personnel may in some instances perform functions which a government agency may not properly perform. Its primary purpose is to assist in every possible way in securing the effective use of psychologists in the war effort and in insuring a continuing supply of trained psychologists. Since the National Roster of Scientific and Specialized Personnel, 10th & U Streets, N.W., and the Office of Psychological Personnel, 2101 Constitution Avenue, Washington, D. C., are geographically separate, and are concerned with different problems, every psychologist should notify *both offices* of any change in either his *employment* or *Selective Service* status. Information sent should include: (1) *full* name of registrant, (2) mailing address, (3) Selective Service order number, (4) name or number of Local Board, (5) full address of Local Board, and (6) *specific* description of present employment or research, especially as related to the war effort.

PSYCHOLOGY AND THE WAR: NOTES

Filing of Information on "Necessary Men." The following material appeared in *Selective Service*, September 1942, II, 1 and 3:

Issuance of a simplified Form 42-A and revised Form 42 designed to greatly assist employers in their application for deferment of "necessary men" and to lessen the "paper work" of local boards when considering occupational classifications, has been announced by National Selective Service Headquarters.

With the issuance of these revised forms, National Headquarters urges that employers be advised to use them in connection with all "key men" among their workers, regardless of whether or not these registrants have been deferred for other reasons.

The filing of the information required by the forms is particularly advisable, it was pointed out, in connection with a "necessary man" who has been deferred for dependency in Class III-A or Class III-B because it would help to prevent possibility of his induction, when those categories are being considered for military service, without the employer having had opportunity to present evidence of the man's necessity to him. Furthermore, the filing of application for the deferment of an employee gives the employer a right to appeal a change in the employee's classification.

The Form 42-A, on which industrial employers make application for deferment of necessary men, has been reduced from a four-page to a two-page document, although all questions necessary for the submission of pertinent information have been retained.

Revised Form 42 is for use by employers other than industrial and is in the form of an affidavit. Agricultural employers, in particular, may use this Form 42 in addition to any agricultural forms from other agencies intended to show the necessity of an individual registrant.

Questions relating to students, previously included on the Form 42-A, have been eliminated, and in the future colleges and others applying for the occupational classification of students should use Form 42. The American Council of Education Form 10 should be attached to Form 42.

Filing of either form by a proper person, other than the registrant, entitles the person who filed to take an appeal from local board action when he believes the registrant has been improperly classified.

Needs of Army for Technically Trained Men. According to *Science* magazine of October 2, 1942, the Honorable Henry L. Stimson, Secretary of War, issued a statement on September 17, part of which is reproduced below:

The Army is greatly in need of men of specialized training, particularly in physics, chemistry, engineering and medicine. We are equally interested in having adequate numbers of men of such training available to war production industries and the civilian research agencies of the government. Plans are now being worked out for the method of training of those inducted into the Army, but in any event it is hoped that the colleges will maintain their training of students in engineering, medicine and other sciences. In some cases, it will be necessary to expand this

training. Occupational Bulletins of the Selective Service System have been issued from time to time which relate to college students in these fields essential to the war effort. I now re-emphasize the fact that where students in these fields and their teachers fall within the classifications for deferment by the provisions of these bulletins they are doing the job their country wants them to do and are performing their full duty in the war effort.

Although psychology is not specifically mentioned in this statement, this paragraph may be useful to some psychologists in bringing to the attention of Selective Service Local Boards the need for continued training of many students in the scientific and technical fields. It should be noted that Mr. Stimson calls especial attention to Occupational Bulletins of the Selective Service System.

How the Army Sorts Its Man Power. Psychologists are undoubtedly often asked to describe various aspects of the classification program of the Army. A scholarly article on "The Army Personnel Classification System" was published by Dr. Walter V. Bingham in *The Annals of The American Academy of Political and Social Science*, March, 1942, 220, 18-28. The same problem is also discussed in more popular style by Walter V. Bingham with James Rorty under the title "How the Army Sorts Its Man Power," in *Harper's Magazine*, September, 1942, 185, 432-440; this has also been reproduced in the *Infantry Journal*, October, 1942, 51, 22-30.

Monthly News Letter from Psychological Abstracts. The Office of War Information has asked *Psychological Abstracts* to prepare a monthly News Letter embodying reports of psychological research done in the United States. These letters, of which four have been issued, are translated and distributed through facilities of the Department of State to sixteen countries outside the Western Hemisphere. Each letter begins as follows:

PSYCHOLOGY NEWS LETTER FOR TEACHERS AND STUDENTS OF PSYCHOLOGY,
PSYCHIATRISTS, NEUROLOGISTS, EXPERIMENTERS IN PSYCHOLOGICAL LABORA-
TORIES AND WORKERS IN ALLIED FIELDS

Dear Sir:

The war has disrupted the world-wide exchange of information on progress in all fields of science. Research does continue, however, and to keep you informed of the work being done today in the United States in the field of psychology, this communication summarizing recent research has been prepared by the American Psychological Association. It is distributed by the Department of State of the United States Government and more copies can be secured at any Legation or Embassy of the United States. A similar communication will reach you once a month.

BOOK REVIEWS

ANGYAL, ANDRAS. *Foundations for a science of personality*. New York: The Commonwealth Fund, 1941. Pp. xii + 398.

The general purpose of this study is to present in a rather extensive outline form the basic principles necessary for the formulation of a science of personality. By personality, Angyal means the dynamic process of living which, in the case of man, includes all those factors which bind him into superindividual relationships. Assuming that man is more than a mere concatenation of physiological, psychological, and social functions, the author argues that what is needed is not a combination of the results of the segmental sciences (the sciences which study isolated aspects of a person) but rather an entirely new science. Fully utilizing his background as a psychiatrist and biologist, Dr. Angyal attempts to formulate such a new science by bringing together the various sciences of man into a unified, holistic system.

Pointing out that life must be viewed as a unified whole, he sets out to discover the leading principle according to which it is organized. Justifiably arguing that so many current theories of life are immanent—that "the part processes have the function to maintain life; and life is an aggregation of these part processes"—Angyal escapes this "biological nihilism" by positing extra-organismic happenings such as assimilation and production, both of which escape the closed circle and when synthesized can be roughly defined as a process of self-expansion. This process of self-expansion does not take place within the organism but between the organism and its environment. For Angyal the organism and the environment are not discrete entities but two indispensable poles of a single unitary process namely life.

This life process is delineated in two ways: first, by a tendency toward increased autonomy (self-government and control over the environment) and secondly, by a tendency toward homonomy (conformity with such superindividual wholes as the family, society, culture, etc.). The life process takes place in a unified whole which he calls the biosphere. "The biosphere includes both the individual and the environment, not as interacting parts, not as constituents which have independent existence, but as aspects of a single reality which can be separated only by abstraction."

The general dynamic pattern (autonomy and homonomy) of the organism has specific channels of expression, which when carried to the extreme become observable aspects of behavior. "The specific ramifications of the general dynamic trends form the skeleton of the personality structure." Because of the high degree of individuality of these specific ramifications, Angyal deals more intensively with their roots—that is with their more general expressions. Thus for example, the author posits three basic dimensions in which the various personality manifestations are arranged: the vertical dimension, the dimension of progression, and the transverse dimension. The first of these represents the development from general trends to superficial concretization of specific aspects of behavior. The second represents the development of a "means-end organization," whereby specific cravings, etc. are realized. The third dimension is one of

breadth, in which there is a "synergetic organization or coordination" of the various surface tendencies of the organism.

The different specific manifestations of personality, such as the trends toward autonomy and homonomy, basic cravings, drives, wishes, etc., are all integrated into a unified system. It is with regard to the system principle that Dr. Angyal makes his most valuable contribution to psychology and psychiatry, for it is in the disturbances of system integration that the basic abnormal personality manifestations have their etiology. Preferring the term "bionegativity" to "abnormal," Angyal points out that the "bionegative constellations" have two components which must be separated if one is to get a clear picture of a given (mental) disturbance. One to distinguish between symptoms caused by the introduction of a traumatic agent (causal) and those produced by the organism's reaction to the trauma (organismic reactions).

Throughout the book the author has attempted to maintain a neutral attitude toward the various scientific disciplines. Of especial interest to psychologists is the differentiation he makes between psychophysically neutral processes and psychological experientialism, such as the difference between biological tension and interests, drive and craving, etc. There is considerable emphasis upon the analogies between his postulations and those of psychoanalysis, which is understandable in view of his psychiatric background. A great many of his ideas appear to be adaptations from Stern's Personalistics. It seems peculiar to this reviewer that no mention is made of the Gestalt concept of isomorphism since it seems to be quite similar to his concept of the biosphere.

On the whole, he has presented a valuable synthesis of many hitherto divergent views along with many new theoretical concepts. The book is well written, being singularly free of errors. Each chapter is well summarized saving the reader needless back-tracking. It can be heartily recommended to those psychologists who profess an interest in the theoretical setting of their discipline, although it was not written primarily for any one group of specialists. Although the book is not very well documented with experimental evidence, such an omission does not constitute a valid criticism since it was prepared solely as a theoretical outline. In all, Dr. Angyal has carried out his stated purpose admirably.

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DOCKERAY, F. C. *Psychology* (revised). New York: Prentice-Hall, 1942. Pp. xiv + 514.

In revising his text-book after a seven year interval, Dockeray has evidently been influenced by several considerations. One of these indicated in the preface, is "the increasing demand that the first course in psychology be made functional in the life of the student." Though he intends to go part way toward meeting that demand, he still believes the first aim of a text should be "to help the student understand human behavior." To make the immediate application of psychology more apparent to the student, Dockeray has changed somewhat the emphasis accorded various topics in his earlier edition. The most important addi-

tions however seem to be a good number of illustrative anecdotes and the inclusion of a quantity of practical advice, which sometimes verges upon direct exhortation. In the chapter on personality, for example, the reader is urged thus: "Get acquainted with your fellow students; make friends.—Take your college experience, therefore, as an opportunity for you to practice getting along well with people.—But when you have discovered your shortcomings, *do* something about it. We would almost be justified in saying *do anything*."

It is surely commendable for an author to give substance to the abstractions of a science by referring to the reader's experience. Yet there are dangers to be met in the endeavor. The extensive use of anecdote may lead the reader, as Dockeray suggests, into a too facile psychologizing. Advice has its special perils, for psychology is hardly a normative science, and any venture into the imperative mood presumes some ethical predilection of the writer. Like most psychologists Dockeray evidently considers the ethical basis of choice outside his proper field of discussion. Yet it may be argued that the reader who is being advised ought to be told in clear words what kind of man the psychologist desires to make him.

In my mind there lurks a suspicion that the purpose of interesting students by pointing the moral may widely miscarry. Both normal and "maladjusted" persons so frequently resent even requested advice that they might form a distaste for a book containing much of it. A disinterested consideration of alternatives and their consequences might, in fact, accomplish the purpose better.

Yet it is hardly fair to emphasize so much this aspect of Dockeray's book, when he has but used for flavoring, what some make a main dish. Other important reasons for Dockeray's revision were evidently his wish to include recent experimental material and to bring the work abreast of changes in his own thinking. The book is rich in accounts of experimental methods and results. These actually constitute the principal focus of attention, if not the bulk of the work. Examination of the dates in the footnote references shows about a dozen more recent than the previous edition of the book.

As one would expect the framework of psychological doctrine is not greatly changed in the new book. It is such as will appeal to most American psychologists as sound and substantial. It is a simple tough-minded psychology with a preference for "objectivity" and no great elaboration of fine distinctions. On the whole, it is probably a good representation of contemporary American psychology, and a reader would develop from it the outlook which is desired in the usual course in psychology. There are, of course, certain doctrines which would be disputed by many. It may be judged from a remark in the preface for example, that Dockeray feels himself on rather thin ice when he describes the behavior of genes for musical talent.

Certain changes which have been made in organization, emphasis and terminology are interesting in their suggestion of a trend in the science. There is still a section on "biological background" (restricted now to genetics) but far less is made of it than before. The concept of stimulus-response and reflex action which was extensively treated earlier, now re-

ceives little specific attention, and conditioning, likewise important before, now gets only two pages (though both are treated by implication elsewhere). Though emotion is still treated as "disorganized behavior" much less is made of the terms organized and disorganized behavior than before. "Attention" now replaces "Efficiency of Organization" as a chapter heading. "Perceiving" is used in place of "Sensory Discrimination." There changes may represent the waning of Weiss's influence upon Dockeray or a more general trend toward conformity to psychological tradition.

At the end of the book there is an extensive list of varied questions on each chapter which ought to be useful to the student trying to understand the subject.

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GATES, ARTHUR I., JERSILD, ARTHUR T., MCCONNELL, T. R., & CHALLMAN, ROBERT C. Educational psychology. New York: Macmillan, 1942. Pp. xviii + 805.

This text was originally designed as the third edition of Gates' *Psychology for Students of Education* but actually represents an almost wholly new content. As an example of coöperative writing, it is to be commended for the integration of the various sections and the smoothness of its style. The authors' avowed purpose, "to produce a text in which personal bias is reduced to a minimum," is achieved without the monotony which such efforts sometimes produce. Another objective, "that the most important problems of education should be brought forward and grappled with in the light of the findings of educational psychology even if the data were not as yet very extensive," is adequately realized, though some might question the authors' selection of "the most important problems." In the discussions of relatively unworked fields, there are not many suggestions for needed research, which might well be expected. However, it must be admitted that this book is designed expressly for students preparing for the teaching profession, not necessarily for educational or psychological research. Finally, the authors have attempted to present "a candid statement and critical evaluation of available information." Although discussions are quite well documented, the references, collected at the ends of chapters, are indicated in the text by such small type numbers (6 point) that their effect is minimized. Instructors who wish their students to become aware of sources may find this a problem since the reader's tendency is to overlook the citations made in the text.

In developing their objectives, the authors state they are careful "to avoid exaggerating the practical values of the psychologist's devices, such as personality or intelligence tests." However, they mention numerous such measures throughout the text and reproduce sample items freely but include only very brief discussions of the shortcomings and the limits of usefulness of the devices. For example, the characteristics of good tests are dismissed in two paragraphs; validity and reliability are treated in less than four pages of very general discussion. While a minimal emphasis

on the values of tests may be in keeping with recent trends in the teaching of educational psychology, the widespread use of published measures of all sorts would indicate a need for adequate treatment of their limitations.

The authors hold that various "schools" of psychology are coming closer together and add: "The present book, it is hoped, includes facts, principles, and applications in a form acceptable to persons with preferences for any one of the major systems. Certain distinctions among theories will be considered in particular contexts which provide especially clear and useful illustrations. Thus something of the flavor of different points of view will appear without an effort to develop a complete systematic presentation" (13). Although this statement acknowledges a condition which will definitely annoy those who seek consistency of terminology or adherence to a single set of descriptive or "explanatory" principles, on the other hand, the eclecticism which it represents may be quite desirable for the practical ends to which this book is turned.

Chapters II through VIII by Dr. Jersild present a summary of the material on child development found in any good modern text on child psychology, such as Dr. Jersild's own book in that field. The seven chapters on learning and problem solving by Dr. McConnell avoid taking any consistent theoretical position except to reiterate that learning is a self-active process, most effectively carried forward with materials which are meaningful in terms of the learner's own experiences. Something more than the usual amount of material on thought processes is included. The chapter on meaning is novel to educational psychology texts and presents a clear logical exposition of the problem, recognizing that little has been done by way of its psychological solution.

Chapters XVI and XVII by Dr. Gates discuss tests and measurements, giving considerable attention to the recent educational concept of *evaluation*. Discussions of many forms of tests and test items, kinds of scores, types of standard tests now available, the significance of norms, and rules and suggestions for teacher-made tests are illustrated with an example in most cases. Possibly the brevity of this section is explained by the authors' statement that "the whole field of testing and measurement, appraisal and 'evaluation' in education is so young, in fact, that the teacher may expect to find a good deal of confusion, disagreement, and dogmatic opinion in it as in any new area" (546).

The final four chapters of the book, by Dr. Challman, are given to a well illustrated survey of child needs, conditions productive of thwarting, and resulting nonadaptive or maladaptive behaviors. The treatment of mental health hazards of the school child is chiefly discursive, containing some testimonial and experimental evidence of the extent and potency of the hazards named. The discussions of specific techniques and methods in child guidance, such as the case study, projective methods, personality and interest inventories, the interview, and observational methods are rather brief to be informative. The chapter on the mental health of the teacher, which discusses difficulties inherent in the profession, occupational insecurity and other sources of frustration, and the specific kinds of maladjustments faced by teachers, is reasonably new to educational psychology texts.

In general, the text attempts a wider content in rather less conventional style than earlier editions. It may be that it covers too much ground in too condensed fashion to furnish the best illustration of the conditions favorable to learning stressed by the authors. Thus they feel that to be learned effectively, material must be meaningful; to be meaningful, material must be experienced in a variety of relationships and contexts in order that the learner may achieve generalizations out of his active contacts with the material against the variety of backgrounds. But their text is inclined toward summarization, generalizations, and statements of conclusions and implications, with relatively less emphasis on the exposition of specific items of information, facts, and charts and tables containing basic data. It probably will be most useful to instructors wishing to acquaint students with the scope of the field included in present-day educational psychology.

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MUENZINGER, K. F. *Psychology: the science of behavior.* New York: Harper, 1942. Pp. xi + 441.

Among the many textbooks of psychology, Muenzinger's takes its place with the few—such as those of Titchener, Watson, Hollingworth, and Wheeler—which adhere consistently to a single theoretical standpoint. Indeed, the author makes this feature his excuse for adding one more text. Since his formulation is both original and a product of modern psychology, it is in itself a sufficient justification. "This book should be judged," he states in his preface, "as an attempt at a systematization of psychology no less than as a textbook." I shall take the author at his word and consider the book first as a system and secondly as a text.

By systematization Muenzinger means, as he states in an appendix, not a structure of postulates and theorems, but a method of description. There is probably no sharp distinction here, since the adoption of a conceptual framework is an essential step in logical procedure and determines the form which deductions must take. Concerning the character of Muenzinger's theoretical approach, psychologists will want to know two things: First, how does he handle the relation between subjective and objective data? Secondly, what for him are the psychologist's elements, the end-products of analysis?

With respect to the first problem, the author draws a clear-cut distinction between objective processes, which can be observed by another, and subjective processes, which can be observed by the subject alone. Only the former are suitable for direct scientific description. The latter can be dealt with only indirectly, either through the subject's verbal report or through a study of the conditions under which the subjective qualities occur. Readers who, for example, recall Pratt's lucid discussion may take exception to the author's frankly dualistic position in this respect. Is not all scientific description based, in the last analysis, on immediate experience? And is it not all at least one step removed from that experience?

With respect to the second problem, Muenzinger characterizes his own

view-point as a simplification of field theory. He achieves this simplification by means of two devices: a unit of description and a frame of reference. The unit he has chosen is a segment of behavior progressing in a constant direction from starting-phase to end-phase, the S-E cycle. Behavior is considered to be made up primarily (though not exclusively) of such cycles. The frame of reference with respect to which these units are to be described consists of four categories: (1) motivation, i.e., those factors determining the direction and strength of behavior; (2) discrimination, the analysis and organization of the situation; (3) performance, which modifies the situation in the direction of the end-phase; and (4) affectivity, the effect on the subject of changes in the dynamic stresses of the situation. The result of this organization is more than a fresh approach to the time-honored topics of general psychology. The author's illuminating discussion of certain of these topics gives abundant evidence that his choice of descriptive concepts is a happy one.

A few points of special interest growing out of the present system may be mentioned. One is that processes may be distinguished in terms of whether or not they constitute S-E cycles of behavior. On this basis the author makes the distinction between task and movement, so important for the problem of response equivalence in learning. By the same criterion he differentiates reflexes from both voluntary and automatic behavior. Many conditioned responses, in contrast with conditioned reflexes, he considers true S-E units and presents evidence to prove it. More arbitrary but also useful is his distinction between *feeling* as an immediate consequence of sensory stimulation and *emotion* as a function of the subject's progress toward a goal.

A second point of interest is Muenzinger's treatment of learning, of which different aspects appear under each of the four categories, to be summarized in a convenient appendix. All learning, for the author, consists of varying amounts of two processes: (1) the reorganization of the situation, a matter of discrimination; and (2) the increase of efficiency, a matter of performance. Repetition, which is essential to the second process, is not essential to the first. But associationists will be relieved to find that the dichotomy is not complete. Repetitions are needed sometimes (e.g., by a rat in a discrimination box) "in order to fixate the new meanings (131)." One wonders whether, after all, the function of repetition is essentially different in the two processes.

A third point of interest is the author's novel treatment of perception and meaning as related to psychological movement toward an end-phase. A fourth is his attempt to differentiate specific emotions by analyzing the dynamic factors involved, an attempt which is the more stimulating since most psychologists abandoned the effort when physiological methods failed. In general, whether one agrees or disagrees with him, Muenzinger provides his colleagues with new food for thought on old topics.

As a text in general psychology the book has two possible hurdles to surmount; the theoretical bias of the instructor and his attitude toward the purpose of the first course. Concerning the latter question Muenzinger states his views explicitly in the preface. His aim is "to present scientific psychology in a professional manner to college students." He

makes no compromise with the recent trend toward popularizing psychology. Students should not be bribed nor denied what may be their one contact with psychology as a science. As with other sciences, whether the student enjoys his contact is and should be an individual matter. Obviously this book will appeal to the tougher-minded teachers of psychology. But tough and tender, instructor and student alike, its users can find reassurance in the knowledge that they are dealing with the genuine article.

Since the subject-matter is treated as an integrated whole rather than a series of separate topics, its organization is important. The book is divided into three parts. In Part I, called *The dynamics of behavior*, the author builds his theoretical structure. Part II, dealing with psychophysiology, contains much that is conventionally treated under the topics of motivation, emotion, sensation, perception, action, and the nervous system, but arranged in accordance with Muenzinger's framework. Part III takes up individual differences and social relationships. It contains a chapter on mental hygiene which is not just another list of defense mechanisms, and a discussion of propaganda which is both timely and incisive. The true gist of the book, however, is contained in Part I.

From the teacher's standpoint, and probably from the student's as well, clarity of organization is the text's outstanding virtue. At the beginning of each chapter its contents are put in relation to what has preceded it. Topics and subtopics are plainly identified by a decimal system of numbering. On the other hand, clarity of outline is achieved at the expense of fullness of treatment. The author's succinctness tends to leave the reader with his appetite whetted but unsatisfied. There is a danger here that *too* bare a handling may fail to stimulate any appetite at all. Some writers pad their discussions *ad nauseam*; Muenzinger barely covers the bones. This lack of sheer bulk makes supplementary reading a necessity.

In conclusion I can do no better than to quote once more from the preface: "This is not a handbook of, but an introduction to, the science of behavior. It is the ground plan, the theoretical framework, which must be clearly traced so that the facts of behavior can be placed in proper relation to each other."

JOHN P. SEWARD.

Connecticut College.

WALTON, A. *The Fundamentals of industrial psychology*. New York: McGraw-Hill, 1941. Pp. xiii + 231.

This book was prepared primarily for use as a text in connection with foreman training classes in industrial plants. Its simple, non-technical, and somewhat abbreviated style indicate that it is intended for laymen and to be supplemented by lectures and discussions. The conservative psychologist may feel that more adequate explanation with proper reservations would make it a more scientific treatment. This discussion of the essential topics, however, is dependable, and is written by an author who has had extensive training and experience both as an engineer and as a psychologist.

Many of the sixteen chapters might be considered under larger headings, although the interrelationships are not always pointed out by the author. Chapter II, Human Habits, develops a theme that appears in Chapter VI, The Basis of Personality, and Chapter VII, Resistance to Change. This theme is epitomized in the statement: "The personality, then, is the sum total of these habits one has accumulated in the three systems of his being—the muscular, the emotional and the verbal or reasoning mechanisms."

Aptitudes (unlearned) and Abilities (learned) and their measurement (tests) are treated in three chapters. There is no attempt to give techniques but rather understanding to the foreman so that he can appreciate what the industrial psychologist is trying to do.

Efficiency Methods and Scientific Management (Chapter VIII) and Fatigue, Monotony, and Accidents (Chapter XIII) receive briefer discussion, but more similar to that found in other textbooks. As it is described, "psychological fatigue" is evidently meant to be identical with "monotony," although that association is not clearly stated. The chapter on training in industry could also be included here as receiving more conventional treatment.

Motivation, although that psychological term is never used, receives as much attention as any topic. It is discussed under Psychological Factors Enhancing Efficiency, When the Human Machine Gets Out of Adjustment, and Attitude Building. The psychologist may feel that these concepts developed here are most effectively presented to the foreman or other layman reader.

This little book is made interesting by the introduction of factual material and even of opinions that are not psychological. Bits of history, such as the work of Leonardo da Vinci as a time and motion study efficiency engineer, a little social and economic theory on labor relations, and some advice to emulate Ben Franklin can not be deduced from evidence found by any psychologist in a laboratory. The author has taken the risk of offending professional colleagues in order to carry a message to the layman foreman and supervisor. Doubtless it does that, and it will be effective, particularly if it can be accompanied by lectures and discussions, or followed by more advanced technical reading.

BRUCE V. MOORE.

The Pennsylvania State College.

WATSON, GOODWIN (Ed.). Civilian morale. Second yearbook of the Society for the Psychological Study of Social Issues. Boston: Houghton Mifflin Co., 1942. Pp. xii + 463.

This is a symposium on democratic morale, its peculiarities as contrasted with autocratic morale, methods of its development, its points of stress and strain, its measurement. The contributors are G. W. Allport, T. M. French, Kurt Lewin, Gregory Bateson, Lois Barclay Murphy, Ronald Lippitt, Alex Bavelas, S. S. Sargent, Theodore Newcomb, Donald Rugg, Joe and Eugenia Belden, Otto Klineberg, Kenneth B. Clark, J. D. Ketchum, J. S. A. Bois, Richard L. Hull, Arthur Kolstad, Goodwin Wat-

son and Gardner Murphy. Besides being editor, Goodwin Watson contributes three articles: "Five Factors in Morale," "Morale During Unemployment" and "Labor Unions and Morale." Two articles: "Children Are Important to Morale" by Lois Barclay Murphy and "Morale Among Negroes" by Kenneth B. Clark evidence a spirited conviction as to what's wrong with democratic morale and as to what is to be done about it. In the concluding chapter Gardner Murphy points out the essentials for a civilian morale program in American democracy.

This war, unlike previous wars, involves the total population military and civilian of the belligerents. In fact the civilian population is so much more heavily involved than in former wars that it has become the very target of physical and psychological attack by the enemy. More than ever before the entire civilian population from the very beginning needs to feel the direct sacrifice of its peace-time satisfactions and privileges and to share in the common cause by way of safety-measures, salvaging of waste-materials, occupational readjustment, bond-buying, heavy war-taxes, war-production and an invulnerable spirit. The center of gravity in psychological warfare has accordingly shifted from military to civilian morale: the supreme objective of the enemy is that of breaking down the civilian morale of the opponent while energetically bolstering its own civilian morale.

The building of civilian morale in democratic countries accustomed to a *laissez-faire* policy is much more difficult than building morale in autocratic countries where the chief end of man from childhood on is the subordination of self to the State and where ruthless means are used to make individuals fit the Procrustean bed of the State.

The present work keenly appreciates this fact and labors to find ways and means of enhancing democratic morale without downright subscription to autocratic methods. It is duly recognized that democratic morale, once the nation has attained a certain complexity, lies somewhere in the middle of the road between *laissez-faire* and autocracy, between Jeffersonian and Hamiltonian policies. In every event, it is imperative that democratic morale retain the following pristine features: voluntary, wholehearted participation, reverence for the individual human personality, equal rights without regard to race, nationality, color or creed, economic self-respect and social status for all individuals, majority rule, representative and evocative leadership, tolerance, freedom of speech, recognition of the whole man, war never an end in itself, voluntary co-ordination of effort.

With individuals and groups long accustomed to do much as they please, unanimity in the democratic nation as a whole becomes a problem of great magnitude. Segregation, oppression, non-recognition of minority-groups, intra-group disharmonies, sectionalism, interdenominational strife, conflict between labor and capital, exploitation, haphazardness in child-guidance, tainted politics, the democratic masquerading of autocratic leadership in high and low places are cited as lines of cleavage in democratic civilian morale. It is freely admitted that national unanimity cannot be secured by the ballyhoo methods of the first World War because people are better educated, primary group controls have conspicu-

ously weakened, the efficacy of propaganda has been destroyed by advertisers, pacifism has gained considerable foothold, and the apathy of the individual in the matter of accepting responsibility has increased. The picture of morale in Canada and in the United States at the time that this book was written evidenced much indifference, passivity and internal conflict. It should be noted, however, that much of the content was written before Pearl Harbor.

Remedial measures more or less of a long range-character are suggested for heightening democratic civilian morale. It is proposed in the light of experiments that prospective leaders, especially those in face-to-face relations, be trained in democratic leadership. Every medium of propaganda and education—moving pictures, radio, newspapers, magazines—should build favorable attitudes toward the laborer and the Negro. There is needed formulation of a goal in this war which will be not only dynamogenic but unifying to all elements of the democracy. Each individual should have a specified task at which he may feel himself more actively contributing to the winning of the war. A nation-wide centralized child-care program along with general schooling in democratic philosophy and practice would insure the future mental and physical health of the nation. Finally it is strongly suggested that a permanent unified non-political national morale research committee be established to act as a clearing house for all proposals and endeavors which have to do with the public welfare.

Not only are there special difficulties in the way of building democratic civilian morale, there are also difficulties in the way to unanimity among psychologists as to the meaning of the term *morale*. Morale is a term which is to be defined otherwise than in a strictly logical fashion. It may be described or its conditions or functions may be cited such as physical and mental health, a reasonable measure of life-satisfaction, control of fear, extroversion, integration, hope, confidence, equanimity, perseverance, comradeship, singlemindedness, unanimity, teamwork, organization, efficiency, positive attitudes. In the present work morale is more often regarded as attitude. With favorable or positive attitudes the morale is considered as high, with negative attitudes the morale is regarded as low. Kurt Lewin thinks that hope or aspiration best typifies morale; Goodwin Watson believes that life-satisfaction best does it. In the reviewer's opinion confidence appears the most conspicuous facet of morale although the other facets can not be overlooked. When the confidence of the individual or of the group is low, the morale of the individual or group is necessarily low. Gordon W. Allport would give a many-sided description of national morale as "(a) the healthful state of the convictions and values in the individual citizen that endows him with abundant energy and confidence in facing the future; (b) his decisive, self-disciplined effort to achieve specific objectives that derive from his personal convictions and values; and (c) the agreement among citizens (especially in times of crisis) in respect to their convictions and values and the co-ordination of their efforts in attaining necessary objectives."

Efforts to measure civilian morale limit themselves at present to the measurement of some one facet of morale Lewin would measure aspira-

tion, Watson life-satisfaction, Hull and Kolstad attitude of worker toward his job and his company, Joe and Eugenia Belden attitudes of college students toward war involving the U. S., Donald Rugg public opinion. American morale as measured in terms of attitude or opinion was overwhelmingly sympathetic toward the Allies even before America entered the war.

Two factors influence morale in the sense of attitude according to S. S. Sargent: 1. environmental changes themselves and 2. other people's interpretations of the environment. The latter influence is called propaganda. Propaganda, a second phase of psychological warfare, is closely linked with morale. It aims to build morale at home by shaping attitudes while it seeks to demoralize the enemy. To be effective propaganda must have as its starting point an accurate acquaintance with the attitudes already existing or capable of existing among the people in question.

As a whole the book, despite the haste with which it was brought together, its wordy and desultory character, its lack of uniform merit, gives much food for thought about the state of the nation on the eve of entering upon its greatest war. Certain of its suggestions merit a try-out in the present crisis.

On the other hand, the book falls somewhat short of expectations as a thoroughgoing down-to-earth psychological attack upon concrete morale problems. With scattered exceptions it is more concerned with an overall philosophy of democratic morale rather than with the ways and means for smoothing out the psychological snags in the war effort such as are looming up every day. For example nothing is said with respect to the means of counteracting the demoralizing effects to the citizenry of announcements and counter-announcements presumably emanating from the Government as to taxes, rationing, drafting of married men. Nothing is suggested with respect to vocational readjustment of war-workers or with respect to morale-problems of civilian defense. Much of this inadequacy of the book may, however, be excused on the score that it was written in the main before Pearl Harbor. Things have happened so swiftly since its writing that it would be fairer to say that the book was almost out of date before its publication save for its reinterpretations of the democratic creed.

F. C. SUMNER.

Howard University.

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BORNSTEIN, J., & MILTON, J. Action against the enemy's mind. Indianapolis: Bobbs Merrill, 1942. Pp. xxi+294.

CLARKE, F. P., & NAHM, M. C. Philosophical essays in honor of Edgar Arthur Singer, Jr. Philadelphia: Univ. Pennsylvania Press, 1942. Pp. x+377.

COWDRY, E. V. (Ed.) Problems of ageing. (2nd Ed.) Baltimore: Williams and Wilkins, 1942. Pp. xxxvi+936.

INBAU, F. E. Lie detection and criminal interrogation. Baltimore: Williams and Wilkins, 1942. Pp. vii+142.

STONE, C. A., & GEORGE, J. S. Work units in educational statistics. New York: Harper, 1942. Pp. v+154.

NOTES AND NEWS

RUDOLF PINTNER, professor of education at Teachers College, Columbia University since 1921, succumbed to a heart attack, November 7, at the age of fifty-seven years. Dr. Pintner, who was born in Lytham, England, came to the United States in 1912. He was professor of psychology (1912-13) at the University of Toledo and instructor (1913-14), assistant professor (1914-17), and professor of psychology (1917-21) at Ohio State University. DR. PINTNER had served for many years as Associate Editor of the *Psychological Bulletin*.

Dr. H. J. PETERSON, professor and head of the department of psychology at Mississippi Southern College (Hattiesburg) succumbed to a heart attack May 22, 1942.

In accordance with the vote of the American Psychological Association, September 3, 1942, "that a committee on the curriculum in psychology for the preparation of students for war service be created to cooperate with the Committee on College Curriculum Adjustments of the U. S. Office of Education Wartime Commission," the President of the American Psychological Association has appointed the following committee: HENRY E. GARRETT, *Chairman*, HORACE B. ENGLISH, EDNA HEIDBREDER, ERNEST HILGARD, B. V. MOORE, LOUISE OMWAKE, and DAEL WOLFE.

The program of Laity Lectures for the coming session at the New Work Academy of Medicine includes a lecture entitled *Growing Up Normally* by DR. MYRTLE MCGRAW, to be given on March 25, 1943.

The honorary degree of doctor of letters was conferred by Colgate University on September 24, 1942, upon DR. GEORGE D. STODDARD, Commissioner of Education of the State of New York.

WALTER S. WATSON, director of admissions and student relations at Cooper Union, New York City, has been promoted to an associate professorship of psychology.

CHARLES E. MEYERS, has been appointed to the department of psychology of the University of Denver.

ROBERT P. HINSHAW, of Princeton University, has been appointed assistant professor of psychology at Kenyon College (Gambier, Ohio, replacing SAMUEL CUMMINGS, who is in the Navy.

JOHN W. M. ROTHNEY, assistant professor of education, University of Wisconsin, has been granted leave of absence to serve in the psychological division of the Air Force.

DR. DOROTHY BIRD NYSWANDER, of the New York City Department of Health, has been named regional supervisor of War Public Service Projects of the Federal Works Agency.

HENRY T. TYLER, professor of psychology, Sacramento Junior College, has been named vice-president of the college.

THOMAS W. REESE, has been appointed to the staff of Mount Holyoke College as assistant professor of psychology and education.

A. STERL ARTLEY, for the past two years assistant in the Reading Clinic, the Pennsylvania State College, has been appointed instructor in psychology, Stephens College, Columbia, Mo.

KINSLEY R. SMITH, assistant professor of psychology, Pennsylvania State College, has received a leave of absence to do psychological research for the United States Navy.

The William James lectures at Harvard University for the year 1942-43 will be given by EDWARD LEE THORNDIKE, under the general title "*Human Nature and Human Institutions*." Following are the topics of the lectures: (1) The original nature of man: the genes of the mind, (2) Modification by the environment: learning, (3) Human relations, (4) The psychology of language, (5) The psychology of language: the origin of language, (6) The psychology of government: rulers and ruled, (7) The psychology of government: laws and the law, (8) The psychology of punishment, (9) The psychology of welfare: the welfare of individuals, (10) The psychology of welfare: the welfare of communities.

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